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See advertisement on page 7

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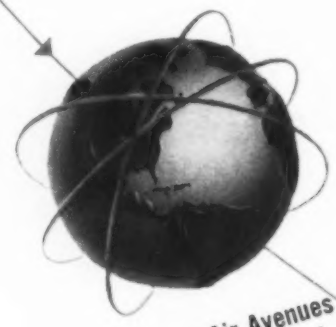

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The gap shown here between hangar floats is location of submerged hydraulic hoist. Two men can hangar a plane in less than a minute. Personal planes account for 95 percent of flights, with over a thousand hours logged per month.

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MARCH, 1947 VOL. XXVII, NO. 3

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Including MODERN AIRPORTS

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The Birdmen's Perch

By *Major Al Williams*, ALIAS, "TATTERED WING TIPS,"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.

Have you been in or out of Washington National lately?

If so, you may have seen what we fear will be responsible for our downfall . . . the cause of a life of crime, maybe.

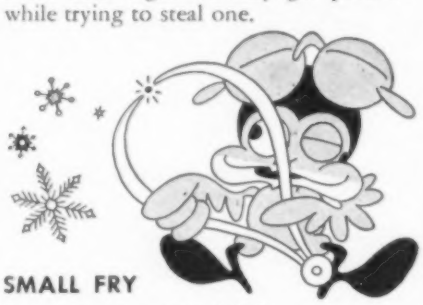
The Gulf gang at WA has its "field headquarters" in a trailer right down on the loading ramp, you see. When a big airliner comes in the Gulf lads may have to travel clean across to the opposite end of the apron to gas her up. And at WA that's a piece of traveling!

So to get back and forth, they use a rig that looks like a park bench on a three-wheeled motorcycle . . . going backwards. And that little puddle-scooter really winds up!

Well, we've watched those octane artists come piling out of the trailer, leap onto the bench, and go scooting merrily through the breeze to the far ends of the concrete (in less time than it takes to say Good Gulf Aviation Gasoline) so many times that we're envious. In fact we're deep-green-jealous!

We want one of those jitter buggies!

We want one so bad that we're afraid some dark night we may get pinched while trying to steal one.



SMALL FRY

Ever measure a snowflake?

They're tiny, see? But when they hit an airplane, they get even smaller. They break up into 30 to 500 fragments per flake, and produce enough static electricity to enthusiastically louse up your radio communications. Not to mention your eardrums!

But the nasty little snow particles are big, blubbering, oversized sissies compared to some of the particles that make trouble in a drop of crude oil!

For these little trouble-makers are no bigger than a molecule. In fact they are molecules! Now, some of the molecules in a drop of oil are tough enough to prevent metal-to-metal contact between a piston and cylinder! But there are others with no gumption at all. They'd turn into carbon or form sludge at the drop of a helmet.

The process of extracting these weakling molecules from crude oil is called "refining." And the end product is lubricating oil.

Gulf's exclusive *additional* refining step, which gets even more of these shiftless molecules out of already *refined oil*, is called the "Alchlor Process."

And the end product is a super-lubricant called Gulfpride Oil!

Which you should use.

LITTLE KNOWN FACTS

Here are 3 new Little Known Facts About Well-Known Planes, each of which has gotten its sender a fancy-shmancy commission as Perch Pilot (bottom rung). If you know a "Fact" as interesting as these and send it in—*with proof*—you too can join the rarified ranks of America's rarest pilots!

Perch Pilot (br) Edwin Earnshaw, Kansas City, proved that:

"An aircraft engine delivering 1500 hp consumes 5 times its own weight in air, every hour!"

Perch Pilot (br) Thomas Falatko, Washington, D.C., rates a commission because:

"B-36 crews travel the 85′ tunnel between fore and aft pressurized compartments on a 4-wheeled scooter!"

And Perch Pilot (br) Charles Miller, Sacramento, will get promoted to Senior Perch Pilot before long (that takes 5 accepted "Facts," you know), because this is his 4th "Fact"!

"In entering a traffic pattern and landing, the right wing tip of a 35′-span putt-putt travels about 42.5 feet farther than the left wing tip!"

Got a "Fact"? Got proof? Got a post card?

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AIR Report

Waco Pusher Rolled from Factory

Ground tests of Waco Aircraft Company's radical new 4-place pusher with tail-mounted propeller began last month when the prototype was rolled from the factory, with flight tests scheduled momentarily.

Continued Seabee Production

Although it is not understood why Republic Aviation hasn't done so before now, the firm will soon issue a statement concerning persistent rumors, intensified by a recent Fortune magazine article, that Mundy Peale, who recently succeeded Alfred Marchev, Seabee champion, as president, is cool towards the amphibian and will shelve it to avoid further losses. Marchev, now Republic chairman, has denied the rumor in personal conversations but neither Peale nor the company has commented publicly. However, it should be recalled that Peale was enthusiastic over the Seabee before Republic or Marchev ever became interested —that Peale helped P. H. Spencer build the original wooden prototype and later recommended it to Marchev as Republic's opportunity in private plane marketing. Seabee output, incidentally, was almost doubled in January and was being doubled again in February with the arrival of expensive tooling.

341 Airliners Equipped for ILS

Of 826 transports in scheduled domestic service in Mid-February, 341 had been completely equipped to utilize the CAA's ILS landing systems and 455 were partially equipped, according to a telegraphic survey by Air Transport Association showing airline activity to take advantage of the new landing aids. All the present airborne equipment, which costs about $650 per transport, will be removed in the near future and replaced with new sets costing about $2,500 each as new VHF equipment becomes available.

Automatic GCA Landing System

The Army Air Forces has disclosed development of an automatic radar landing system which, used with standard GCA, will electronically and "without human aid" bring an aircraft to within a few feet above a runway. It is described as incorporating all of the advantages of the CAA's ILS glide-path runway-localizer system as well as GCA's advantages.

Maj. Gen. H. M. McClelland said the new device, which will allow control of three aircraft on the glide path simultaneously, will be able to land all the following types of aircraft: (1) Those not equipped with landing aids can be "talked down" by the control tower; (2) those equipped with visual instrumentation such as cross-pointed meters (as with ILS) can be furnished information for manual landings by the pilot unassisted by ground controllers and (3) aircraft equipped with auto pilots electrically connected to the radio landing equipment can be landed automatically unassisted by ground controllers.

In Brief

Significant improvements have been incorporated in the 150-hp. Bellanca Cruisair at no change in price. They include mufflers and better soundproofing, better interior finishing, new heater, ash trays front and rear, reduction of outboard vertical fins to half size and lengthening of horizontal stabilizer for better ground control, and increase of 60 lbs. in gross weight to 2,160 lbs., with empty weight remaining the same, 1,200 lbs. . . . Ted Nelson, president of Nelson Aircraft, has moved production facilities of the Dragonfly, powered-glider, from San Fernando to San Leandro, near Oakland, Calif., and has halted production pending outcome of market studies. William Hawley Bowlus is no longer with the firm. . . . The new Thorp Sky Skooter, 2-place tricycle, is being flight-tested at Van Nuys. . . . Widespread popularity of the 3-place, 100-hp. Super Cruiser and its 100-mph.-plus cruising performance is inspiring speculation over Piper's possibilities in marketing a 4-place version of the same basic design for $4,000 or less — a neat trick if power and seating can be boosted 25 per cent while retaining the same performance. . . . Flight tests of Cessna's all-metal 4-place Model 195, with 300-hp. Jacobs engine, were completed recently, with a gross weight of 3,350 lbs. and an empty weight, fully equipped, of a little under 2,100 lbs. Its companion Model 190, with 240-hp. Continental, was scheduled for immediate flight testing, with Cessna planning to begin production about June.

☆ ☆ ☆ ☆ ☆

THE CRUISAIR IS A "FRONT COVER" PLANE ANY TIME —IN ANY MAN'S LANGUAGE

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THE Bellanca Cruisair Senior is top flight in more ways than one—in accepted leadership, easy flying features, clean beauty, speed, comfort, economy. Pilots who know all types enthuse over the Cruisair's fast cross-country pace.

Actual performances clocked by a Bellanca test pilot and engineer observer, over a measured course at sea level, and corrected to standard air, are: Top speed, 169.2 mph. at 2,700 rpm. . . . cruising speed, 153.6 mph. at 2,435 rpm. . . . 1,130 feet per minute climb . . . take-off run, no wind, 485 feet . . . stall, with flaps, 45 mph. Tests flown in a Cruisair Senior with an Aeromatic prop, and loaded to 2,100 pounds, indicated a ceiling of over 20,000 feet and a range of more than 650 miles.

Standard equipment includes: Muffler, electric starter, generator and battery; wing flaps; position lights, ignition lock; map compartment; ash trays; shock-mounted instrument panel with Compass, Air Speed, Altimeter, Tachometer, Oil Temperature, Oil Pressure, Fuel Pressure and Electric Fuel Level Gauges. Toe-actuated hydraulic brakes. 40-inch rear seat. Dome light. Interior styling supervised by Howard Ketcham, decorator. Radio loudspeaker unit mounted under upholstery above pilot's seat; radio loop installed to the rear of cabin compartment.

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This is another case in which Pioneer points the way to aviation progress—truly a valuable addition to the Bendix Invisible Crew.

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EDITORIALS

AIR TRANSPORT RESERVE NEEDED

THIS nation is once again stumbling in the dark as regards adequate national defense planning, in spite of the bitter and costly lessons of World War II, in spite of the indisputable evidence cropping up every day that peace in our times is still a faint hope and in spite of the consistent warnings from enlightened military leaders and statesmen.

Our people have lapsed back into the rut of pre-Pearl Harbor false security, little realizing that we have, in less than eighteen months since the unconditional surrender of the Japanese, frittered away the military power that saved us from national oblivion. Especially is this true in the air. As one general recently put it, "We couldn't fight our way out of a wet paper sack."

It is therefore reassuring in times of indecision like these to find here and there, within our aviation industry, some bold thinking and a few isolated cases of bold action. Perhaps one of the best examples of bold, imaginative yet realistic thinking by a representative of our industry is the recent address of C. R. Smith, chairman of the board of American Airlines, Inc., before guests of the Librarian of Congress and Air Power League.

Mr. Smith speaks with authority and from experience. He came up the hard way in the air transport business—not through Wall Street financing or political chicanery. His record as a major general in the AAF Air Transport Command is too well known to recount here. The point is, no one is more qualified to offer proposals for the creation and maintenance of adequate U. S. air power.

It is natural that Mr. Smith calls for the maintenance of an air transport reserve. Assuming that the air forces in peacetime will have logical reason for employing five hundred transports, he finds the necessity of providing from non-military sources a fleet of four thousand five hundred transport airplanes. "If we fulfill the requirement that these forty-five hundred airplanes be of suitable transport type," he states, "and the further requirements that they will, to maximum extent possible, engage in self-sustaining service, then the most logical area in which to find the answer is our basic air transport industry."

He is indisputably correct. But the reserve must not be made up of aircraft owned and operated by the present certificated carriers alone. The Civil Aeronautics Board can delay, but can not ultimately refuse to certificate the air freight operators and others who have crashed into the air transport business by weight of sheer vision and gamble — the same fundamental motivating forces that created our presently certificated carriers.

Can enough business be generated to keep a fleet of forty-five hundred transports operating? We agree with Mr. Smith that they cannot operate empty. Reasonable load factors can be realized, but again it will require bold thinking and bold action to increase the market for air transportation, thereby decreasing the direct cost of maintaining the fleet. Parcel post by air, first class mail by air, encouragement of new venture capital by overhauling Federal air policy so expansion is fostered rather than thwarted, so that public convenience and necessity will be served rather than theories of planned economy, must be forthcoming.

Bold thinking always precedes bold action. We have the first ingredient—straight, honest, constructive and patriotic thinking. Now let's have some action — from Congress, where the initiative for such a program must come as Mr. Smith so brilliantly pointed out in one of the most significant suggestions since the Japs gave up the ghost eighteen months ago.

COLONEL EARLE L. JOHNSON

COLONEL Earle L. Johnson, Cleveland business man and private pilot who helped organize and who almost single-handedly preserved the Civil Air Patrol until his untimely death last month, will be mourned by thousands of American citizens, young and old, who came to know him intimately during the war. Though it will require a considerable number of years for the historians to discover him, Colonel Earle probably will be listed as one of the great leaders in World War II. And although his accomplishments are not generally known, appreciated or acknowledged even by many people who worked closely with him, his CAP army of more than 100,000 men, women and teen-age youths, too old or too young, too halt, lame or blind for acceptance in the military services, will not soon forget his leadership, his extreme personal sacrifice and above all his super-human perseverance in driving through with an idea in the face of every conceivable obstacle.

The Civil Air Patrol has had its faults, its share of troubles and its obvious weaknesses. Yet it still remains one of the most amazing aspects of our people's participation in a total war. To Colonel Earle Johnson goes the bulk of the credit for this astounding, though little-known story of how civil aviation was permitted not only to exist but to volunteer for specific duties in the national crisis so that the regulars might be relieved for more critical jobs.

Civil aviation owes him a perpetual vote of thanks which can best be expressed now by contributing time and energy to the organization he was still fighting for when his airplane crashed last month in Ohio. The work for which he gave his life will be carried on by other good men who also know how vitally important it is for grass-roots civil aviation to be bound together in organization, especially to provide a civil aviation vehicle capable of indoctrinating American youth in the arts and sciences of aeronautics. ★ ★ ★

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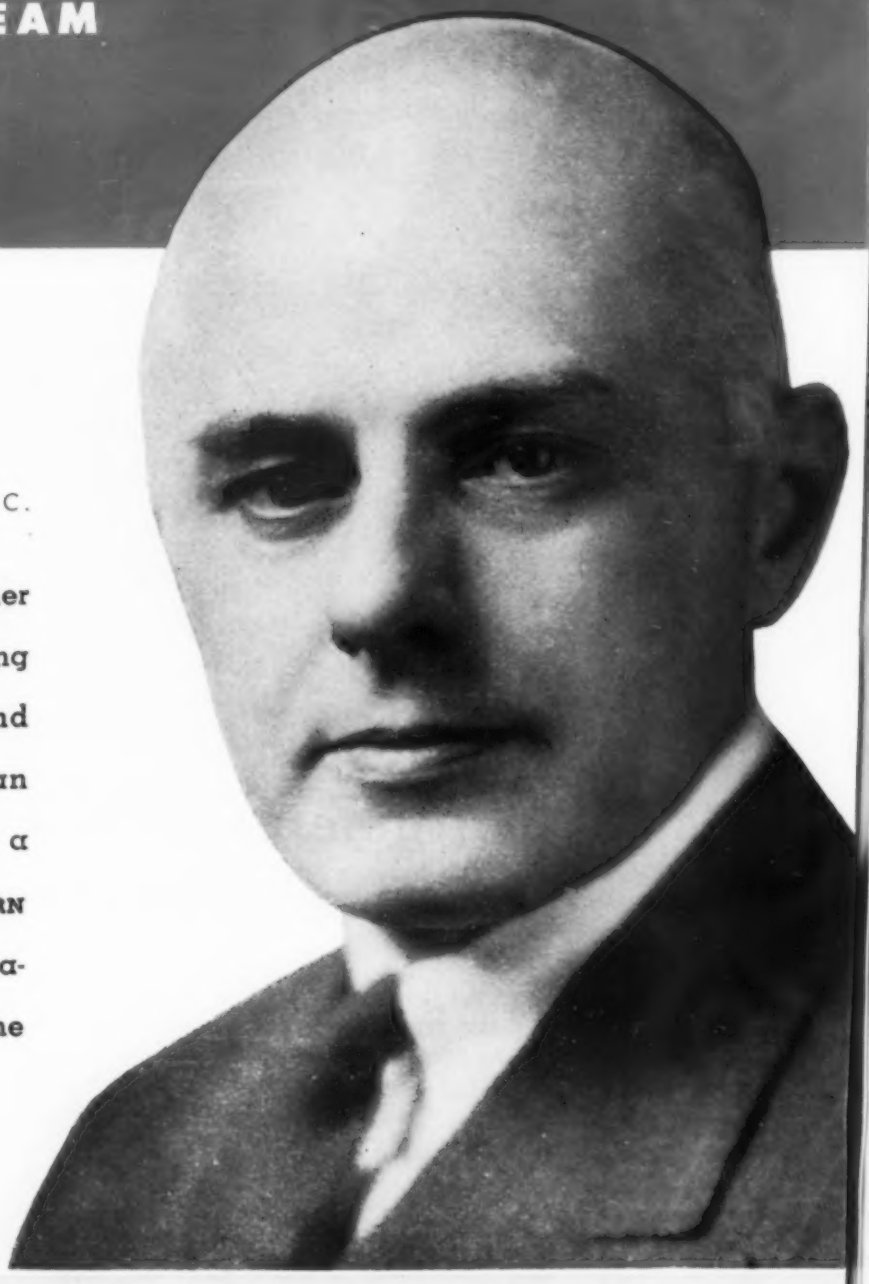
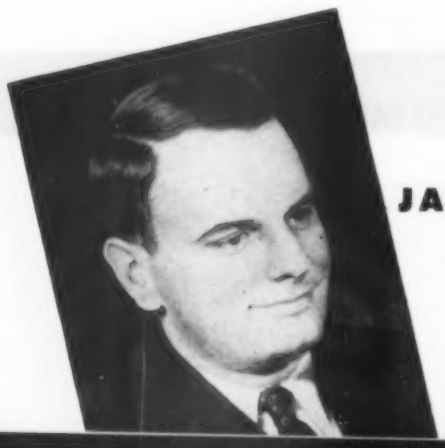


"WHEREVER aviation people gather there is an abounding and consuming interest in their local problems and business. We know the South is an active aviation field, and feel that a regional magazine such as **SOUTHERN FLIGHT** can cover this field authoritatively because of its intimate 'on the spot' knowledge of the area."

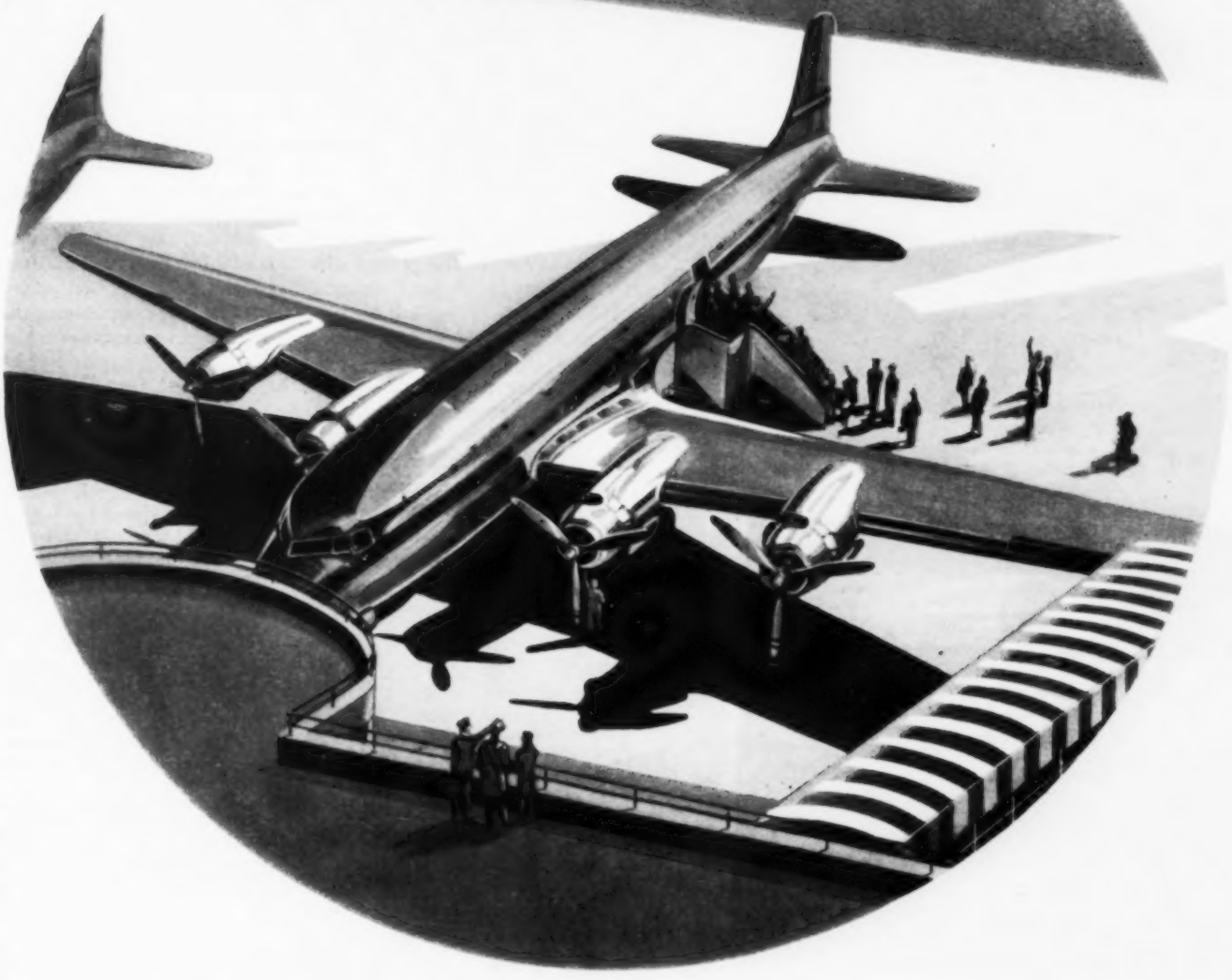


JAMES S. LITTLE *Account executive*

CHAS. DALLAS REACH CO., INC., Newark, N. J. and New York, N. Y.

"WHEN WE took over the Sperry account in late 1945, one of our first jobs was to survey the media on the list they were using. After studying the aviation market in the South, we found there was one magazine that gave us a fine job of coverage. We naturally recommended that SOUTHERN FLIGHT be retained on the Sperry schedule in 1946 and 1947."

Backing the Giants with HYDROMATICS



Time on the ground consumes dollars—decreases efficiency. To meet time-table schedules, while offering greater convenience and comfort, the majority of airlines have selected *reversible Hydromatic* propellers for their Douglas DC-6's. These lightweight, fast-acting propellers provide air brakes for landing and quick reversing for ground handling.

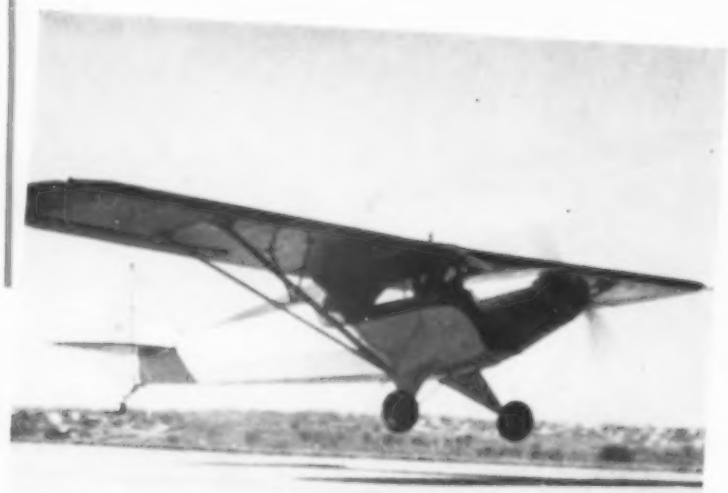
HAMILTON STANDARD PROPELLERS

EAST HARTFORD, CONNECTICUT

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

Flying the Super Cruiser

By JOE JAMES
Associate Editor



IF you've flown the new planes with tricycle gear, flaps and Cadillac fittings, the prospect of making a cross-country in the fabric-covered high-wing Piper Super Cruiser may not be appealing. Right off you get set for a drafty ride in a noisy cabin at a groud speed slightly faster than a snail with the gout. But apparently there's more to this long-nosed 100-hp. 3-seater than meets the eye. Piper sold over a thousand last year and now has orders for more Cruisers than Cub Specials. Dealers, rumors have it, each sundown salaam in the general direction of Lock Haven, Pennsylvania—just in hope another quick-selling Cruiser will start their way. A plane selling like that must have something on the ball, we decided, and a 600-mile cross-country turned up the answer.

A better time couldn't have been selected for our cross-country performance test. Surface winds during the round trip varied from dead calm to 30 mph. and winds upstairs ranged from a balmy tail-wind to chill 35-mph. headwinds. We landed at small airports where trees and short runways demanded steep approaches and short ground roll. We tackled congested traffic patterns at big-city fields where a sluggish plane is practically a cinch to get cut out on final approach.

For safe flight characteristics, the Super Cruiser can hold its own with any private plane. Fully loaded it lands (top left) at less than 50 mph. and handles well at slow speeds. Instrument panel (left) contains necessary contact flight instruments and Hallicrafters two-way radio as standard equipment. Below, two Southern Flight staff members, who accompanied author on cross-country test, wait at Austin Municipal while attendant cleans windshield.

—SOUTHERN FLIGHT photos, except instrument panel by Leslie H. Bowman.

A 600-mile cross-country proved there's more to the three-place Piper than meets the eye.

An easy plane to fly, the 100-hp. Cruiser, carrying three people, averaged 104-mph. ground speed on SOUTHERN FLIGHT's recent cross-country; cruised at 106 mph. true air speed at 5,000 feet, using 2,450 rpm. Fuel consumption averaged 6.5 gallons an hour. The versatile little plane's 800-lb. useful load permits it to carry 38 gals. of gas, 41 lbs. of baggage and three people.

—(Piper Photo.)

Under both conditions, the ubiquitous Cruiser surprised us. But more about that later.

Our test trip started at Meacham Field, in Ft. Worth, and right off we were again reminded that nothing beats a good radio. Although Aircraft Sales Co. provided a perfectly-functioning demonstrator for the cross-country, we checked out first in a floor-model whose radio was being repaired. Tower operators at Meacham Field either believe all lightplanes have radios or expect planes lacking radios to keep going until they get a red light. We banged ailerons for clearance to take-off position with no results. In a high-wing plane it is difficult to keep an eye on the tower when you're taxiing away from it, but we decided to risk it anyway. Then came another wait in warm-up position while we faced the tower and again banged the ailerons. Still no light. So we simply took a quick look at the pattern and headed down the runway. Needless to say, on our cross-country we doubly appreciated the Hallicrafters, which is standard equipment on the Super Cruiser.

Three's a Crowd

Seen from outside, the Cruiser does not promise much room for three people. We found, however, that the baggage compartment behind the rear seat would hold a fairly large overnight bag, our Graflex camera, and several small packages. The lid cover also serves as a shelf and here we stowed three overcoats, hats and some pajamas. A large map pocket on the back of the pilot's seat took care of computer and maps.

Occupied by two people, the back seat becomes a close fit. The rear-seat passenger on the left side is cramped for leg room because of the pilot's seat. His neighbor has ample leg room, however, and gets the better deal in more ways than one. If you have to double up in the back seat, grab the right side.

Dual controls give the Cruiser extra utility. But when two people occupy the rear seat, the stick is merely in the way. Rudder pedals are placed on either side of the pilot's seat and neither rear seat passenger can reach both at once. With this in mind, it is wise to remove the stick when using the Cruiser as a three-placer. Passengers will then have more leg room and, during a gusty approach, the stick won't bang their knees like a broom handle gone berserk.

On the ground the Cruiser handles as nicely as any high-wing plane we've flown. Its squat design makes for good handling even in high winds, particularly with two passengers on the back seat. We left the line at one airport when surface winds were up to 30 mph. and had no difficulty reaching take-off position. A faster low-wing fabric-covered plane needed a man on each wing as it taxied ahead of us. The Cruiser's heel brakes strike us as rather antiquated but that is a matter of personal taste. Since the Piper has a steerable tail wheel, heel brakes had to be used very seldom. S-turning is a "must" when taxiing near the line but once on a clear taxi strip you can add throttle and zip along at 25 and 30 mph. as smoothly as in a car. The bang and clatter common to some tail-wheel designs are missing.

Even in a light wind the Cruiser gets off in a very short run. The factory-advertised run of 480 feet is well within reason and in most cases conservative. Once in the air, the Piper climbs best at 75 mph. Plenty of right rudder is needed to offset torque. The big trim tab at the pilot's left knee is very effective and will hold the Cruiser in a 75-mph. climb hands-off.

Finding best cruising attitude for the Cruiser is no easy job. We leveled off at 5,000 feet, pushed the nose over slightly below the horizon, and rolled the tab forward to relieve stick pressure. Then we set the throttle at the recommended 2,450 rpm. and waited. Shortly the non-sensitive altimeter had picked up 400 feet. So we shoved the nose a bit lower and went through the procedure again. Still climbing. In correct cruise attitude, we found, the nose rides a good hand's width below the horizon.

Cruise Performance

Indicated air speed at 5,000 feet with 2,450 rpm. averaged 98 mph.—about 106 mph. true air speed. The Cruiser covered the 260-mile distance to San Antonio in 2 hrs. 44 min.—an average ground speed of 96 mph. Wind was 35 mph. and cut our 177 magnetic course from 262 degrees, accounting for the ten-mile loss in ground speed.

Flying at 5,000 feet, we found the cabin actually more comfortable than we had dared expect. Conversation can be carried on without shouting and there are no annoying cross drafts. Air does get into the back seat area through the window fitting but this could be easily remedied. The cabin heating system puts out plenty of warm air but distribution to the back seat could be better. The left window slides back and may be cracked during cruising or completely opened.

It's merely an overgrown Cub as far as cockpit gadgets are concerned. There's a mixture control and two fuel selectors to check, the engine primer is conveniently placed on the panel and pushing a button kicks over the starter.

An automobile-type parking brake under the panel's right corner sets or releases the brakes. Unlike some planes, the Cruiser has its radio conveniently placed on the instrument panel. Earphones and mike are plugged in under the panel's left corner. Some place to hang these when not in use is needed. At present the microphone can be placed nowhere but in your lap and the cord frequently loops around the extra set of rudder pedals.

When it comes to safe flight characteristics, the Cruiser can hold its own with any private plane made. Extremely stable, it is safe at slow speeds, has no vicious characteristics, and is very easy to land. Fully loaded, at 3,000 feet above sea level, it stalled power-off at 47 mph. The stall is very gradual and if back pressure is applied slowly the Piper will mush rather than stall. It reacts about the same way in turns, stalling at a higher speed in proportion to amount of bank.

Approaching an airport, the Cruiser handles more easily if you slow it down to 80 mph. and roll on plenty of back tab. At this speed you can govern the rate of descent with throttle and slow down quickly as you line up the runway. Seventy miles an hour is good on the straight-away and as you ease off power it will take more tab to keep the nose up. Nose-down the Piper picks up speed in a hurry. At sixty-five over the fence you can expect good control right up to 50 mph.

We approached San Antonio's Alamo Field in a 120-mph. let-down, slowed to one hundred as we joined the pattern, and by staying close to the field on the down-wind leg we held our own in much faster company. A low-wing job with wheels down moved up to pass us on the right as we started cross-wind but our "Piper Cruiser turning base" got a quick "Piper cleared to land" from the tower. Our friend on the right was now second to land and did a 360-turn while we serenely went our way. He probably thought we were a Cub Special.

Coming back from San Antonio, we stopped at Austin to spend the night and found excellent service at Robert Mueller Airport. An attendant was on hand to service and tie down our plane. The control tower operator seemed to have a warm spot for lightplanes and made us feel we belonged on his runways just as much as the big four-engine transport braking along behind us. When we came out early next morning, an attendant hurried out to untie our plane.

Best altitude for the return trip was 2,500 feet where a 5-mph. tail wind was promised by the weather man. At this altitude the Cruiser indicated 109 mph. Ground speed averaged 113 mph. One hour and forty minutes after take-off we were on the ground at Meacham Field. Our ground speed for the entire trip averaged 104 mph.

Critically Speaking

The Super Cruiser doesn't boast a lot of glamour. It's a rather trim-looking little plane with an unusually long nose and high cabin. It offers nothing radically new or different in design. A luxurious interior and elaborately-fitted panel are missing. You get just what you need to fly in moderate comfort and no more. Visibility is better than in many high-wing planes, due partly to the wndshield design and to a high cabin roof. Entrance requires some thought and practice and a lady in slacks will do the task more gracefully. While the Cruiser will carry three people at 100 mph. or better, it carries two in much more comfort.

It is in utility that the Super Cruiser has its greatest sales appeal. Used as a trainer, inherent safety features permit the instructor to give a student plenty of leeway. On cross-countries, the Piper will average at least 100-mph. ground speed and burns only 6.5 gallons of fuel an hour. This gives it a range of over 500 miles. Highly suited for operation out of small fields, farm strips, and back pastures, the Cruiser is a veritable work horse with 800-lb. useful load as compared to 950-lb. empty weight. Since it's an easy plane to fly, there's no reason why a farmer or rancher or other novice cannot buy, learn to fly and safely use a Super Cruiser.

All of which explains why Piper, in face of reports of a "saturated" personal plane market, is turning out 35 Super Cruisers a day. He's selling that many. ★ ★ ★

Factory Specifications

Model: Piper Cub Super Cruiser, PA-12. Normal category.

Price: $3,295 FAF.

Type: Three-place, closed, land, fabric-covered, high-wing monoplane with full equipment as standard.

Engine: Lycoming 0-235C 100 hp. at 2,600 rpm.

Propeller: Sensenich, wood fixed pitch.

Dimensions: Wing span, 35 ft. 5.5 in.; length 22 ft. 10 in.; height 6 ft. 10 in.

Loading: Wing area 179.3 sq. ft.; wing loading, 9.8 lbs. per square ft. Fower loading, 17.5 lbs. per hp.

Weight: Gross weight 1,750 lbs.; weight empty 950 lbs. Useful load, 800 lbs.

Baggage compartment: Aft of rear seat; capacity 41 lbs.

Fuel and oil: 38 gallons fuel; 6 quarts oil.

Performance

Cruising speed, 105 mph. at 65 per cent power; top speed 115 mph.; stalling speed 49 mph.; take-off roll, 480 ft.; landing roll, 390 ft.; rate of climb, 750 fpm.; cruising range, 600 mi.; service ceiling, 18,000 ft. No aerobatics permissible.

Equipment

Hallicrafters two-way radio, one-piece plexiglas windshield, all necessary contact flight instruments, cabin heater, carburetor heater, mixture control, carburetor air filter, muffler, 12 volt battery, navigation and instrument panel lights, radio, electric starter, carburetor heater and generator.

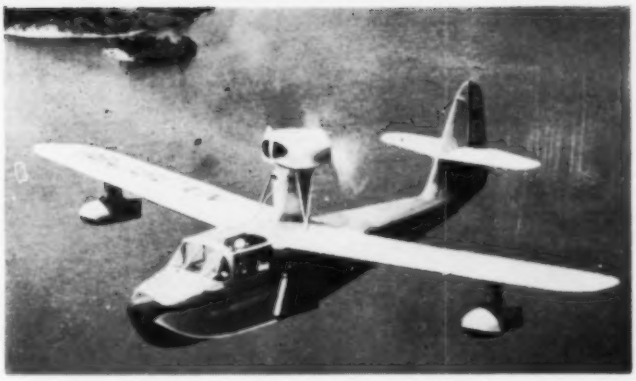
FIRST SUPER CRUISER FROM PIPER'S PONCA CITY, OKLA., PLANT went to the Albright Title and Trust Company of Newkirk, Okla. The Newkirk organization took delivery in a special ceremony (above) at the Piper plant. Left to right, Tom E. Smyer, Piper distributor for Oklahoma; A. Hanford Eckman, Piper plant manager; Miss Dorris Lindsay, Ponca City News, and three Albright officials—Dean Hoye, secretary-treasurer; Roy C. Johnson, president, and Lloyd Wilson, field representative and pilot.

Goodyear Duck

THE GA-2, a three-place amphibian, developed by Goodyear Aircraft Corporation of Akron, Ohio, and called the "Duck," has been awarded an NC license. Flown experimentally since March 8, 1946, the pusher-type design was developed to test Goodyear aviation equipment and has not been scheduled for commercial production.

Powered by a 145-hp. Franklin horizontally-opposed, air-cooled engine, the GA-2 has a span of 36 feet and an over-all length of 26 feet. Its hull is all-metal and its wing is of all-metal structure, fabric covered. Goodyear reports the amphibian will take off after a 1,300-ft. run on water, will land at approximately 50 mph. on either land or water, and has a cruising speed of 110 and a top speed of 125 mph. With thirty gallons of fuel, its range is given as 370 miles.

Design features include electrically retracted landing gear and tail wheel. An engine-driven cooling fan mounted on the propeller hub is said to solve pusher cooling problems. Spin characteristics and recovery are reported normal and laminated molded plastic wing floats are designed to eliminate "dig-in" tendencies. The Duck carries three passengers and 45 pounds of baggage. ★ ★ ★



Flight view of GA-2 (center) emphasizes pedestal installation of 145-hp. pusher Franklin with Aeromatic propeller. Note wide landing gear (above) and single-strut floats. On water, (below) the "Duck" is said to need only a 1,300 ft. take-off run. Hull is all-metal and wing structure is metal, with fabric covering.

Signs in the Sky

By CHARLES KELLY

TEN thousand feet above the city, Skywriter Jim Gregg flipped a lever that sent a puffy white stream of vapor boiling out behind the BT-13, converted especially for this work.

Gregg counted five seconds, switched off the lever, then swung around to watch the vapor trail's long, narrow shadow move like a big black snake across the terrain. He was checking the speed and direction of the wind aloft in preparation for writing a sky sign, a job that's both tough and lucrative.

Don't let anybody kid you—skywriting is an art in precision flying and split-second timing. Make a mistake upstairs and you'll probably get laughed out of the sky. Brother, there just aren't any sky erasers handy. Besides the advertiser pays $150 to $1,000 per sign, depending on the size and number of letters, and he wants his money's worth. A sky sign is usually readable only twenty to thirty minutes, so it must be good while it lasts.

Altogether there are less than a dozen active sky-scribblers in the United States—nine to be exact, all former Army and Navy pilots who are members of a profit-sharing firm known as the Skywriting Corporation of America. They own 24 airplanes and operate over approximately 1,000 U. S. cities and in Mexico, Latin America, Cuba and Canada.

Principal reason for this scarcity of skywriters is the fact that the Skywriting Corporation of America owns all the satisfactory sky-ink, a secret chemical mixture with an oil base that forms a thick, clinging vapor when injected into the exhaust under pressure. It isn't smoke, as some believe. In the past other ambitious would-be skywriters have attempted to duplicate SCA's sky signs, but so far all efforts have failed. However, expiring patents may soon bring competition.

Each of the nine members of the firm has his own territory. In the BT-13, which has a constant speed prop and larger carburetor, Jim Gregg covers 13 Midwestern and Southwestern states and all of old Mexico.

He carries his secret vapor concoction in a specially-designed 65-gallon tank, placed slightly forward of the rear cockpit. The rear seat, rear instrument panel and blind flying equipment have been removed to make the plane lighter. The chemical mixture is

forced under pressure into the Pratt & Whitney's exhaust with a special pump fitted into the accessories section.

With a full tank of sky-ink Gregg can puff out eight signs in warm weather because the oil mixture flows freely. In cold temperatures, when the fluid becomes slightly stiff, he gets nine. Normally, however, he writes only four to six per flight, covering two or three cities in the same area. The average Pepsi Cola sign is usually about 15 miles in length, from first to last letter, and one mile measured vertically.

The fine art of skywriting cannot be learned, as you might suspect, in a day or week. It took Gregg, who had logged 3,800 hours as a Pan American and ATC pilot, an entire month of constant practice to learn how to write one sign, "Pepsi Cola." Then he flew under the tutelage of an old-timer, Gus Ficken, who took him out over the isolated prairies for a thorough course in the art. Six months later he was a finished skywriter.

How It's Done

The skywriter spells out his message horizontally, with the letters reversed, as they would appear if you looked at the reflection of this printed page in the mirror. He doesn't write backwards or vertically as many believe.

First, he climbs to an altitude of 10,000 to 15,000 feet, wherever the air is the smoothest. From here his sign will be visible 15 to 25 miles. Then Gregg lets out a test stream to check the speed and direction of the wind. This he determines by watching the shadow on the ground.

Early in the morning or late in the afternoon, he probably couldn't find it. The angle of the sun would throw it too far away. Therefore, most of his skywriting is done between 10 a. m. and 2:30 p. m. when the sky is bright and clear and when the maximum number of spectators are outside to see the sign.

A secret "smoke" formula controls the $500,000 sky-scribbling business, capitalized on precision flying and showmanship.

If the wind aloft is from the west, Skywriter Gregg picks out a street or road running north and south, crosswind. This is his reference point, by which he will align the vertical sections of his letters. Under ideal conditions, when the wind is steady at 15 to 20 mph., Gregg actually streaks out each letter over the same area. By the time he's finished with it, each puffy-white letter has been blown conveniently away so he can start the next right over his reference point.

In strong winds, however, the skywriter depends upon his directional gyro to align his letters properly. Gregg can puff out a satisfactory sign in a 75-mph. gale, but he must start far upwind and keep chasing his letters as he writes. If he didn't, the spacing would be so great that spectators on the ground couldn't read the sign. Likewise, too little wind upstairs poses a problem. Then he must keep backing up as he writes.

Having estimated the speed of the wind, Gregg banks the BT-13 on a course parallel to the road, flying crosswind. He uses full power, bringing his air speed to 135 mph., which he maintains throughout the 11 minutes it takes to write "Pepsi Cola" in the sky. His left hand flips the vapor lever, instantly releasing a fluffy white stream from a bulky tube extending from the exhaust collector ring down across and slightly below the right wing.

Flying straight and level now, Gregg begins counting: "One thousand one, one thousand two, one thousand three," and so on up to eighteen seconds, making the vertical back of the letter "P."

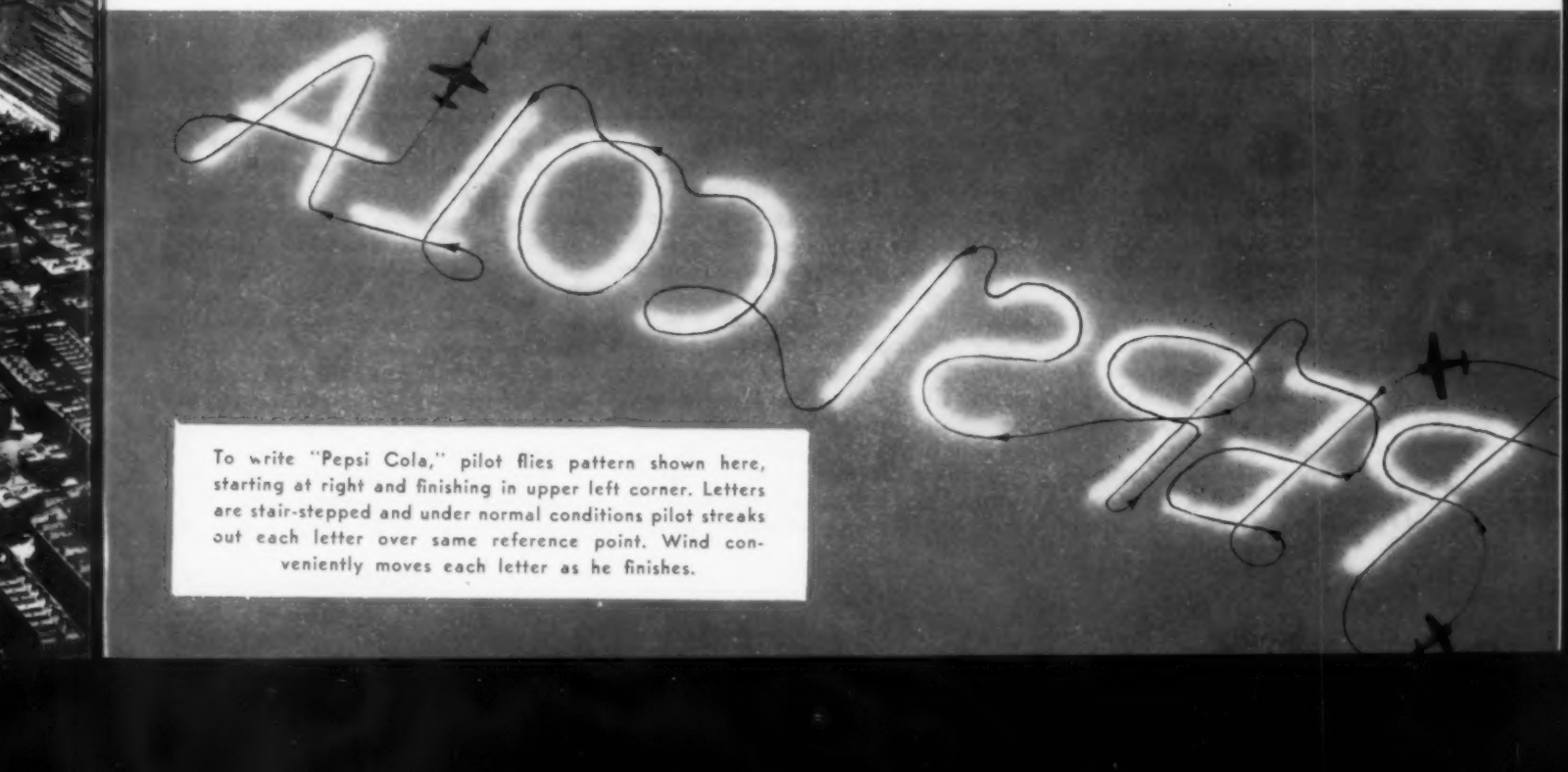
Then he brings the airplane around in a sweeping turn, flying slightly higher and into the middle of the mile-long stream of churning vapor. With his left hand poised, Gregg switches the lever again precisely at the moment when the BT-13 passes over the white streak. The arc of the "P" boils out through the tube as he banks sharply around to the top of the letter, the point where he originally started.

Sky letters usually appear on the same level from the ground. Actually they are stair-stepped. Each subsequent letter is placed about fifty feet higher than the preceding letter. Thus the skywriter avoids any possible damage to his previous work from the prop wash.

There seems to be some difference of opinion among skywriters as to which letters are the most difficult. In the "Pepsi Cola" sign Gregg finds the S, C and O the toughest. He must maintain precisely the proper degree of bank to make each letter of equal size, or, as in the case of the O, to bring the plane out of the maneuver without leaving a lopsided oval in the sky. It's exacting work. He doesn't, however, need a turn and bank indicator in this business—if he skids or slips, the vapor starts burbling thick and fast into the cockpit.

In other signs skywriters have trouble with the V, W, K and M. These letters, they say, are a nightmare of angles when you have to write them in the sky. It takes a lot of patient

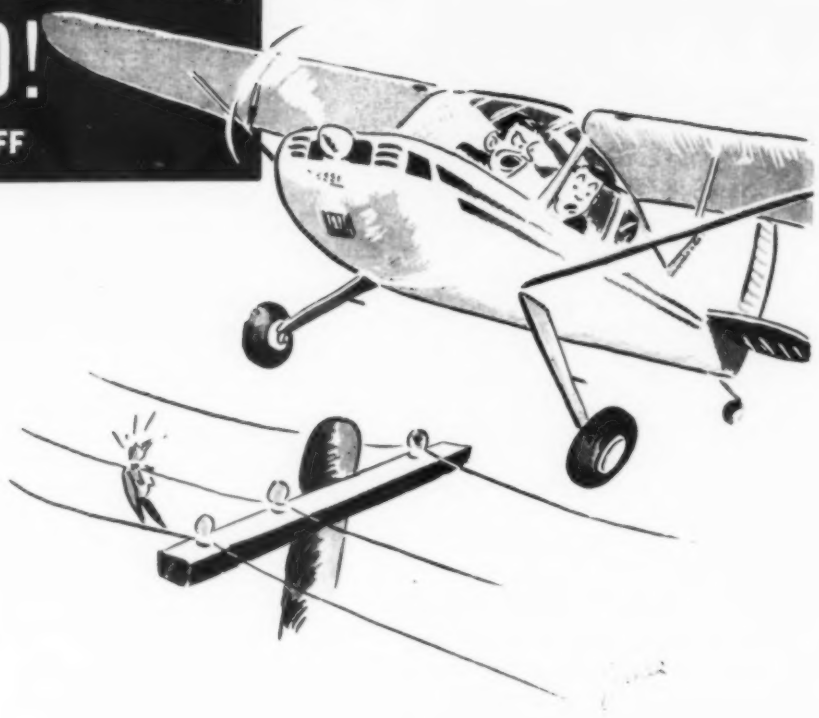
(Continued on page 37)



To write "Pepsi Cola," pilot flies pattern shown here, starting at right and finishing in upper left corner. Letters are stair-stepped and under normal conditions pilot streaks out each letter over same reference point. Wind conveniently moves each letter as he finishes.

OPEN TH' THROTTLE, RICHARD!

By A. H. KNOUFF



If you want to climb, or keep from sinking, there is only one way to do it—with power. Forget this, and other basic rules, and you're asking for trouble.

WE have spent a lot of time explaining that an airplane will not fall helplessly when the engine quits. Yet many pilots have come to grief because they did not realize that there was some truth in this idea. The engine produces power, and you can't fly without power.

A glider or sailplane has no engine, but it must have power to fly. To take off, it usually gets its power from an airplane, automobile or other device which launches it into the air. In flight, the power comes from gravity or from the energy of moving air currents. Since the pilot has no control over these sources of power, he cannot choose the altitude at which he wishes to fly or the rate at which he wishes to climb or descend. The engine gives the airplane pilot a power plant which he can control and thereby select his altitude or vertical speed. When the engine quits, he must depend on gravity. Therefore he must come down—but he does not "fall helplessly."

You may think of the throttle as a speed control because of your experience with an automobile. But the elevator will control the forward speed of an airplane even if the engine quits. Therefore the throttle of an airplane is primarily the altitude or vertical speed control. If you get this firmly fixed in your subconscious, as well as conscious, mind, you will never have to mumble through the bandages that you pulled the stick all the way back but the airplane dived into the ground anyway.

Elevator and Throttle

Like other airplane controls, the functions of the elevator and the throttle are interrelated. If you are holding a constant altitude at 70 mph. and you pull back on the stick to reduce your air speed to 60 mph., the airplane will go up. This is because part of your power is used to pull the airplane forward while another part is used to produce lift. When you reduce the air speed, you no longer need all the power you have used to pull the airplane forward. The extra power begins producing lift. Since the part of the power already producing lift was just enough to hold the airplane at a constant altitude, the extra power made the airplane climb. If you want to slow down without climbing, you must not only raise the nose with the elevator, but must reduce your power by closing the throttle a little.

Why More Power?

If the throttle is the altitude or climb control, why doesn't the airplane jump off the ground when you open the throttle wide for take-off? If you have ever pushed an automobile, you know that you have to push harder to start it moving than to keep it moving. You also know that you have to use low gear to get enough power to start an automobile or to keep it moving at a slow speed. The same is true of an airplane. Up to a certain point, it takes more power to move it at slow speed than at a higher speed. You use all of your power to overcome the inertia of the airplane and accelerate it as quickly as possible to a forward speed at which some of the power can be switched over to producing lift.

Thinking of your throttle as the altitude control should save you from the trap of the "graveyard glide." Instructors have warned students against this man-killing mistake ever since flying began; yet many of them have taught and still teach that you pull the stick back to make the airplane go up. This is not more than one-half of one per cent of the truth. Don't forget that pulling back on the stick will also make the airplane stall and spin. Paste this in your head in big black letters: *The only way to climb, or keep from sinking, is to open the throttle.*

You may get the idea that it is a disgrace to use power on your approach because your instructor teaches you to close the throttle on a downwind heading directly opposite a certain spot and to try to land on that spot without using power. But have you ever seen an airliner approach that way? The pilot who tried it would get fired, pronto. You are taught power-off approaches for just two reasons, the first being your lack of skill. You have your hands full mastering ailerons, rudder and elevator. Your instructor does not want to clutter your thinking with a fourth control.

The second reason for teaching 180-degree power-off approaches is to give you a basic procedure to use in case of

a forced landing due to power failure. Do not neglect your practice of power-off approaches, but remember that this is only one—not always the best—of many ways to land an airplane.

If you think of the throttle as your only altitude control, you will not try to stretch a glide by pulling the nose up. There is *one* air speed at which an airplane will glide the farthest. If you pull the nose up, the airplane will slow down and settle faster than it would if you had kept the nose down. If you even faintly suspect that you may undershoot or overshoot, *open the throttle* and open it plenty.

We have already pointed out that it may take more power to maintain altitude at slow speed than at a higher speed. In a glide, you have downward speed. You will need extra power to check the downward momentum. Even with wide open throttle, it will take a little time for the airplane to change direction. *Don't wait*. You can always make another approach if you use power too soon or too much, but you won't get another chance if you hit the fence either at the near or the far end of the field.

Approaches Which Need Power

If we tried to tell you all the ways of using power on approaches, you would be gray-headed and toothless before we got through. Here are four common situations in which it is advisable to use power:

Suppose you are one of 15 or 20 airplanes in the traffic circle of a large airport. Some of these are faster and some slower than you are. You get behind one of the slower ones. If you fly close enough to the runway to make a 180-degree approach without power, you may cut him out or collide with him. You should reduce your speed to his and use power to maintain altitude. If you can't fly as slow as he does, fly farther out from the field than he is so that you will have farther to go. With this simple procedure, it is possible for a P-80 to follow a Cub around the traffic circle.

Of course, the Cub should show the P-80 similar courtesy by flying as fast as possible. Going into a field where most of the traffic consisted of fighters—in an airplane whose top speed was 140 mph.—I have dived in with the throttle nearly wide open. However, since the faster ships have more equipment such as flaps and constant-speed propellers, their speed range is more flexible than that of a lightplane.

Next, let's imagine you are going to land in a short field surrounded by very high and very solid obstacles. Without power, you have to glide at an angle which will just miss the wires and then slip. That's tricky. Such an angle is hard to judge. If it were not, there would be no point in requiring power-off approaches in flight tests. If you are either too high or too low the results may be tragic.

It is much easier to lose altitude gradually in a wide power-on approach. On the final leg, slow down almost to landing speed. When you think your altitude is the desired margin above the obstruction, add enough power to hold it. Increase or decrease power as necessary until you are sure you will clear the obstacle. Then close the throttle to descend as rapidly as you wish.

The principal caution to be observed is that aileron control may be rather poor and you should use rudder to keep the wings level. Also watch out that you don't unconsciously pull the nose up instead of opening the throttle when you think you are getting too low.

If you have done stalls with your instructor, he has surely called your attention to the fact that the airplane stalls at a much lower speed with power on than with power off. The type of approach I have described takes advantage of this. You can approach the obstacle much slower with safety than you could with power off. Then when you cut the power, the airplane will settle very rapidly. You may control this descent with the throttle right down to the ground. In fact *an airplane may be landed more slowly with power on than with power off*. The Navy takes advantage of this in landing on aircraft carriers.

Forgive me for repeating that it takes more power to fly an airplane at minimum speeds than it does at considerably higher speeds. I repeat it to remind you that it may take full throttle to check your descent if you are in power-landing attitude.

Landing in High Wind

The third situation calling for use of a power approach is strong wind. The reason is obvious. Very few pilots have difficulty making a power approach under these conditions. Many of them spoil it by attempting to make a normal three-point landing at the last moment. This will work if the pilot is careful to kill his air speed gradually so that the ship will not balloon—*if the wind velocity is not greater than the stalling speed of the airplane*. In the latter case, the power approach must be continued right down to the ground, after which the pilot may reduce the power until he stops moving forward. He must sit there flying the airplane into the ground until help arrives to hold it down.

Rough air is related to the problem of strong wind. It upsets the approach plans of the best pilots. A gust may stall your plane or make it fly again after you think you are comfortably landed. Since the stalling speed is lower with power on, you are less likely to stall in a power approach. By making a power-on wheel landing, you can prevent a gust greater than the flying speed of the airplane from picking it up after you are on the ground.

Other advantages of using power are to avoid over-cooling the engine, to avoid passenger discomfort due to rapid change of altitude, to prevent spark-plug fouling.

Let's Talk Torque

So far we have talked only about approaches and landings, but power affects all other phases of flight. You may eventually study the more complicated phases such as cruise control, economy and range. Right now you are most interested in what happens to the airplane when you open and close the throttle. This comes to your attention when the nose swings abruptly to the left on your first take-offs. You may be told, more or less vaguely, that this is due to torque. This is quite true—indirectly.

It is a law of physics that for every action there is an equal and opposite reaction. From your position in the cockpit, the propeller turns clockwise. But do you realize that the engine is pushing against the airplane just as hard as it is pushing against the propeller? The reason the airplane does not rotate around the propeller is because it has more weight to be moved and the wings resist such rotation. However, the airplane actually would rotate slowly to the left if it were not designed so that the left wing met the air at a greater angle and so provided greater lift than the right wing. In solving this problem another is created. The left wing now offers more resistance to the air than the right wing. So it lags behind and makes the airplane turn to the left. You could overcome this by holding rudder, but your leg would get very tired. The designer helps you by offsetting the front of the vertical fin to the left which has the effect of holding rudder for you.

Unfortunately, the relative effectiveness of lift, drag and forces on the fin is not the same at all speeds. In practicing stalls and slow-speed maneuvering you learn that when you lower an aileron to pick up a wing, you create more drag than you do lift. When an airplane starts to move, the drag of the left wing takes effect quicker than the vertical fin. So you have to hold right rudder to prevent turning to the left. In most of the aircraft you will be flying for a while,

(Continued on page 38)

Basic Instruments And Their Function

IV—THE RATE-OF-CLIMB INDICATOR

By BERNARD I. DIAMOND
School Administrator
Eclipse-Pioneer Division
Bendix Aviation Corporation

A PILOT operating an aircraft should know not only the forward rate of travel, but also the vertical speed of the aircraft. A rate-of-climb indicator measures the rate of change of altitude or the vertical speed of an aircraft.

The rate-of-climb indicator is of assistance to the pilot in:

(1) Actual navigation—knowledge of the rate of ascent or descent of the aircraft makes possible the arrival at a prescribed elevation in a given time interval.

(2) Maintaining maximum operating efficiency—every aircraft has an optimum rate of ascent. Climbing at an excessive rate results in a greater consumption of fuel and oil.

(3) Maintaining passenger comfort—a nominal, uniform rate of ascent or descent results in a minimum of discomfort for passengers.

Before rate-of-climb indicators were available, statoscopes were used to indicate a change in altitude. The statoscope contained a closed chamber at atmospheric pressure. If a change in altitude occurred, air would have to flow into or out of the chamber to equalize the pressure difference. This flow was caused to take place through a liquid-filled tube, so that the air passed in bubbles. The frequency of the bubbling was taken as a measure of the rate of change of altitude. The modern rate-of-climb, or vertical speed, indicator, represents a tremendous advance over the simple mechanism used in the early days of aviation.

General Description (Fig. 1 and 2)

Our first classification of the rate-of-climb indicator places it as an extremely sensitive differential pressure gauge. Two pressures act on the diaphragm of the indicator, causing the pointer to move across the dial. One of these pressures is caused to act on the inside of the diaphragm. The greater the rate of ascent or descent, the greater the difference in pressure. Upon leveling off, the two pressures equalize, within a short interval, and the instrument indicates a condition of zero rate of climb or descent. The differential pressure is developed in the following manner:

A single fitting on the instrument case is connected to the static side of a pitot static tube. This fitting allows atmospheric pressure to act on the inside of the pressure-sensitive diaphragm. Atmospheric pressure may act on the outside of the same diaphragm only after passing through a small, calibrated leak placed in the line connecting the diaphragm to the case fitting. In this way, a differential pressure is developed between the inside and the outside of the diaphragm whenever a prolonged change in altitude takes place.

One of the earlier types of rate-of-climb indicators consisted of (1) the indicator, (2) a thermos bottle, (3) connecting lines. The indicator contained a sensitive diaphragm, linkage and the calibrated leak in the form of a small glass capillary tube or metal tube of very small bore. Again the calibrated leak may take the form of a small porous porcelain tube, through which the air diffused. In all cases, the mechanism was activated in a similar fashion.

The thermos bottle served as an insulated reservoir for a supply of air. The air was kept at a relatively constant temperature to minimize errors due to the effects of temperature changes.

The connecting lines were two in number. One was used to connect the thermos bottle to the indicator. The second line was connected to the static tube.

The above installation was and is now known as the exterior-chamber rate-of-climb indicator. Although some are in use today, the general tendency is toward the "self-contained type" some of which have discarded the thermos bottle in favor of other means of temperature compensation.

In general, the self-contained type includes the indicator and the connecting line to the static tube.

Fig. 1—Front view of a modern "self-contained" rate-of-climb indicator.

Interpretation and Use

Although the rate-of-climb indicator was first classified as sensitive differential gauge, it may also be classified as a subnavigational unit. It is not directly a navigational unit but, in a sense, contributes to the successful navigation of the aircraft.

The instrument is calibrated in units of feet per minute or meters per second, ascent or descent. The distribution of the divisions on the dial takes several general forms. The most popular form is that of uniform spacing of divisions, each division equivalent to 200 fpm. Many vertical speed indicators have non-linear (non-uniform) dial graduations. Here the first 500 feet of climb or descent may cover as much as 90 degrees of pointer travel "up" and "down." The balance of the instrument range covers an additional 90 degrees of pointer travel. The most popular range on commercial instruments is 2,000 feet "up" or "down." The pointer travels clockwise for "up" and counterclockwise for "down." The dial is of the zero-centering type, while pointer travel takes place on either side of zero.

Some rate-of-climb indicators have dials which permit increased sensitivity in the upper range, without decreasing sensitivity in the lower range. The reason for this is that most "let-down procedures" require conservative rates of descent, usually 300 to 400 fpm. This gives greater sensitivity where the pilot needs it most. Many military installations require instruments reading

up to 6,000 fpm. ascent and descent.

Because of the inherent lag present in a rate-of-climb indicator, (it takes time for the pressures to equalize across the leak) the utility of the unit is greatly limited. The only satisfactory purpose than can be served by a vertical speed indicator is to assist the pilot in maintaining constant rates of ascent or descent. It is not recommended that a pilot use a rate-of-climb indicator to maintain a given flight level.

Errors and Limitations

The vertical speed indicator is subject to certain errors, because of the inherent design which incorporates the calibrated leak. The pilot would do well to know the limitations of his instruments and thereby make the necessary allowances.

The first and foremost drawback of most vertical speed indicators is that of a lag between the time a climb or dive is initiated and when it is registered on the dial. This lag may be as little as six or eight seconds, but in some of the earlier type instruments may be considerably longer.

Another cause for error lies in the fact that changes in air density which occur with changes in altitude affect the rate of air flow through the calibrated leak. In the modern instruments, however, this error has been reduced to very narrow limits.

The problem of temperature change, and its resultant effects on the mechanism, has been solved to a great extent.

Other errors are caused by the presence of friction and erroneous calibration.

Because of the extreme sensitivity of the diaphragm, the instrument is susceptible to frequent "drifting" of the diaphragm which results in changes in the zero position of the pointer. Accordingly, an external zero adjusting screw is available in many rate-of-climb indicators.

If the pilot and the instrument-overhaul mechanic will remember that the vertical speed indicator is an extremely sensitive instrument, requiring careful interpretation and handling, unsatisfactory reports will decrease. If a pilot believes his rate-of-climb indicator is in error he should perform an actual test by means of a sensitive altimeter and stop watch, rather than go on his impression that the aircraft is climbing or diving at a greater rate than is indicated. The usual cause for a minus error lies in a leaky bottle line, or if the instrument is the self-contained type, a leak in the indicator itself.

(1) The rate-of-climb indicator should be mounted with the other members of the primary flight group, near the compass, and within direct view of the pilot.

(2) At least ten inches of non-magnetic, flexible tubing must be inserted between the instrument and the metal connecting tubing.

(3) The static pressure fitting at the rear of the instrument case must be connected by suitable tubing to the static pressure system of the aircraft. Metal tubing of ¼-in. outside diameter should be used. The tubing should have as few bends as possible and must be rigidly fixed to the aircraft structure to avoid large amplitude vibrations. Install a petcock or suitable drain at the lowest accessible point in the line.

(4) All connections must be airtight.

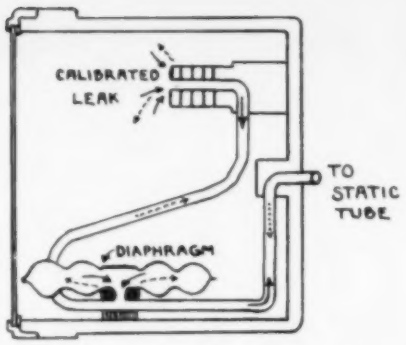


Fig. 3—Basically the rate-of-climb indicator is an extremely sensitive differential pressure gauge. Two pressures act on the indicator's diaphragm, causing a pointer to move. Diagram above shows how differential pressures are developed between the inside and outside of the diaphragm whenever a prolonged change in altitude takes place.

Pre-installation Testing

Before making final connections, apply a very slight suction to the tubing from the static end. Use a short length of rubber tubing in this test. Whenever the altimeter and air speed indicator are connected to the same line, the suction must be applied *very slowly* while the deflection of these two instruments is carefully observed. Pinch off the rubber tubing when an appreciable reading is indicated. If the pointer returns to zero *and then continues downward*, there is a leak in the line. If the pointer makes no movement when suction is applied, the line is obstructed. Remedy any defect before connecting the tubing to the static system of the aircraft.

Trouble-Shooting

For aid in trouble-shooting, typical field reports are listed here with possible causes for defective operation:

1. Inoperative—Lines not connected. Broken thermos. Damaged indicator.

2. Reading in reverse—Lines cross-connected. Defective static pressure. Ground pack effect.

3. Excessive lag—Defective instrument. Old-type instrument. Not using instrument for purpose intended.

4. Too fast—Newer type instrument.

5. Oscillation — Fluctuating static pressure. Unstable aircraft or overcontrolling. Rough instrument panel.

6. Pointer off zero—Effect of blowing in instrument. Effect of excessive climb or dive rate. New instrument. Natural drift in diaphragm. ★ ★ ★

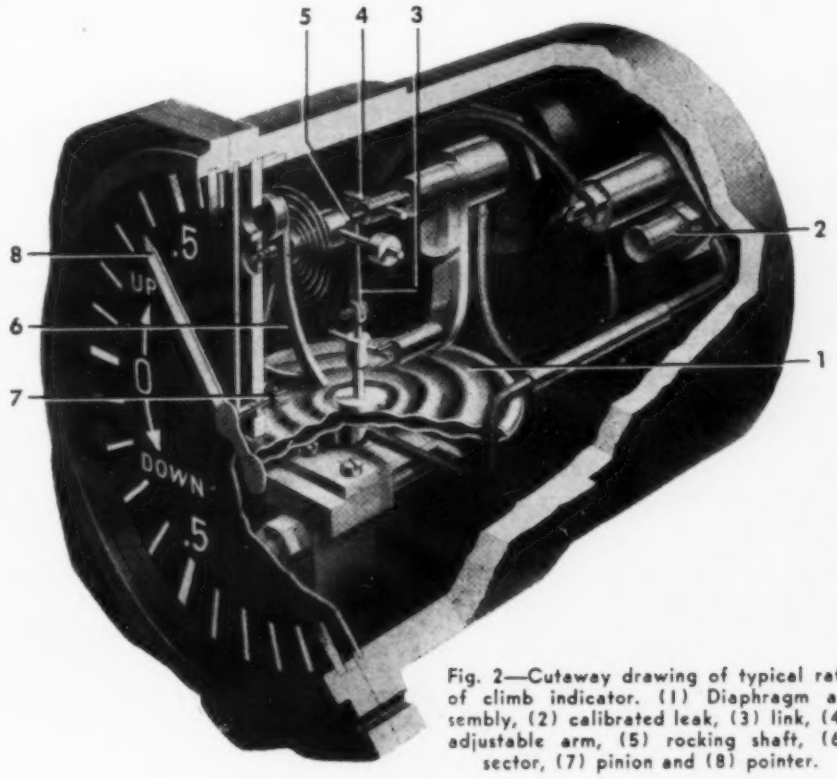
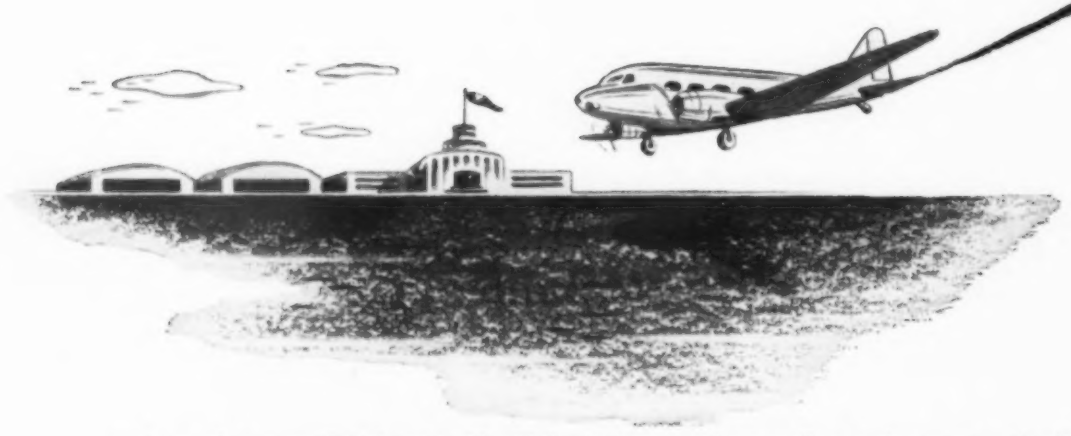


Fig. 2—Cutaway drawing of typical rate of climb indicator. (1) Diaphragm assembly, (2) calibrated leak, (3) link, (4) adjustable arm, (5) rocking shaft, (6) sector, (7) pinion and (8) pointer.

SUCCESSFUL AIRPORTS



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VOL. VII, NO. 1 MARCH, 1947

Modern AIRPORTS

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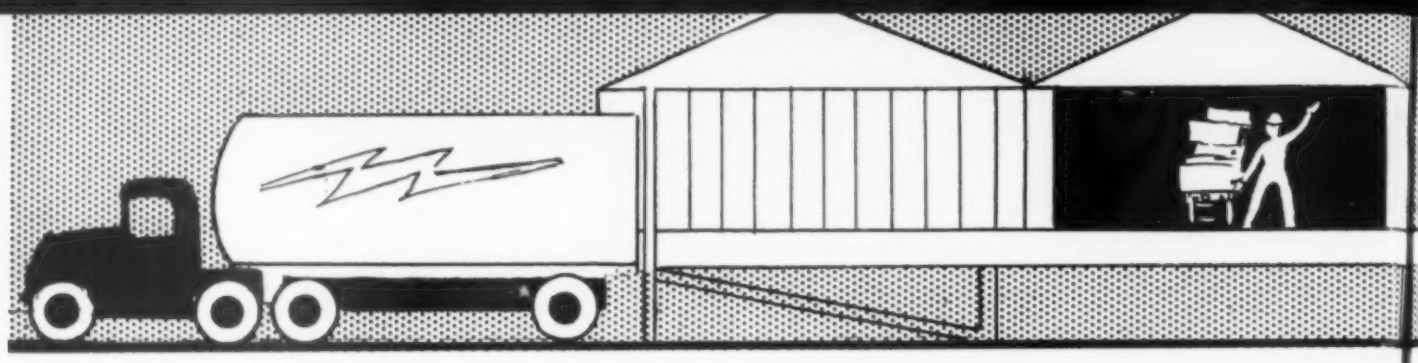
There's plenty to do at Newkirk Sky Park, turf landing field two and one-half miles from Newkirk, Okla. Field has nine-hole golf course (first tee in center foreground) adjacent tennis courts, picnic facilities, and clubhouse with pier for boating and swimming. Lake in foreground is well-stocked with fish. Field will accommodate small twin-engine aircraft.



Terminal Facilities For Air

DURING 1946 air freight made tremendous strides and is now being used daily as a part of normal transportation by large numbers of industries, flower growers, agricultural producers and seafood wholesalers.

When air freight really started growing there were no facilities at any airport other than Air Transport Command and Naval Air Transport Service terminals. Even though these terminals are still in use by the military, many valuable ideas have been gained from them. Still more ideas have been developed as a result of hauling millions of ton miles of commerce during the last twelve months. Commercial air freight encounters new problems every month as it expands.

Looking at the picture today, considering the types of commodities and the methods of packaging, the following ideas for the use of cities and operators in planning air freight terminals and their equipment are suggested:

Minimum Facilities to Start

These can be provided through conversion of some present hangar or building now on the airport. They should be simple, inexpensive and consisting of weatherproof warehouse space, which should contain the following:

Freight platform, raised several inches off the ground to prevent cargo from absorbing moisture. Recommended dimensions are 20 by 100 feet.

Office space for air freight carrier personnel.

Telephones.

Room with sufficient heat to hold 40° or better to protect flowers from freezing.

One fork-lift tractor.

Several sections of roller conveyor.

Twenty-five pallets.

Weather circuit if building is very far removed from CAA and weather facilities.

All the above can be located in part of a hangar or in some other structure, but it should be immediately adjacent to a ramp or taxi strip, so that aircraft can be parked within a few feet of the warehouse for ease of loading.

New Construction, Minimum Facilities

Same as above except freight platform should be constructed with two-thirds of it for light cargo at truck-body height and should adjoin or face a ramp or taxi strip. Equipment should be same as above.

Facilities for Larger Cities

Air Transport Command Type Warehouse: This type is constructed with the whole warehouse at truck-body height and of concrete floor construction. All freight is then palletized and handled by two fork-lifts, one of which is on the warehouse floor and one on ground level to move pallets from warehouse platform to aircraft.

This warehouse should be accessible to trucks on one side and to aircraft on one or more sides. ATC ware-

For an air freight operation to be successful, every economy has to be made. Fork lifts like the one at left reduce expensive labor costs, speed up cargo handling, and permit use of warehouse space. At least one fork lift tractor is a minimum requirement.

ir Freight

By SAM DUNLAP
Executive Vice Pres., Slick Airways, Inc.

houses are usually accessible to aircraft on at least two sides.

This air freight terminal should be equipped with the following:

Heated rooms capable of holding 40° or better to protect flowers and perishables from freezing in winter.

Refrigerated room to protect flowers and perishables from heat in summer — capable of holding 40° temperature.

Office space for traffic and operations personnel of air freight carrier.

A barracks-type room with beds for crews to rest and sleep while awaiting delayed flights, etc.; very simple, similar to army barracks where beds can be rented for 50c to $1.00

Telephones and TWX facilities.

Weather drop to be used by all operators.

Two fork lifts or more.

Numerous pallets.

Several hundred feet of roller conveyors and stands to support same.

One or more powered conveyor.

Stevedore personnel to be used by all operators.

Gravity-Conveyor Type

This terminal has all the features of the ATC type plus the additional feature of a two-story section for packaged goods, agriculture commodities and flowers, which are so packed that they can be handled by gravity on roller conveyors.

The lower floor should be below aircraft ramp level so that all cargo being unloaded from aircraft can be conveyed down by gravity from the aircraft, across the lower floor, and right into the truck. The truck is backed down a graduated incline so that the truck body is the same level as the lower floor warehouse floor.

The upper floor is used for merchandise that is to be loaded into aircraft and has an inclined ramp for trucks to back up to, so that the truck is higher than the second floor level in such a manner that packages can go by gravity down a roller conveyor, across the warehouse floor, and continue by gravity conveyor into an aircraft parked on the ramp in front by the terminal. By this method all packages move down hill at all times. Trucks can be backed up and down easier than packages can be lifted.

All machinery parts, etc., which are too heavy for the roller conveyor should be handled by fork lift from the truck-height freight platform.

Equipment for this type should be the same as for an ATC terminal.

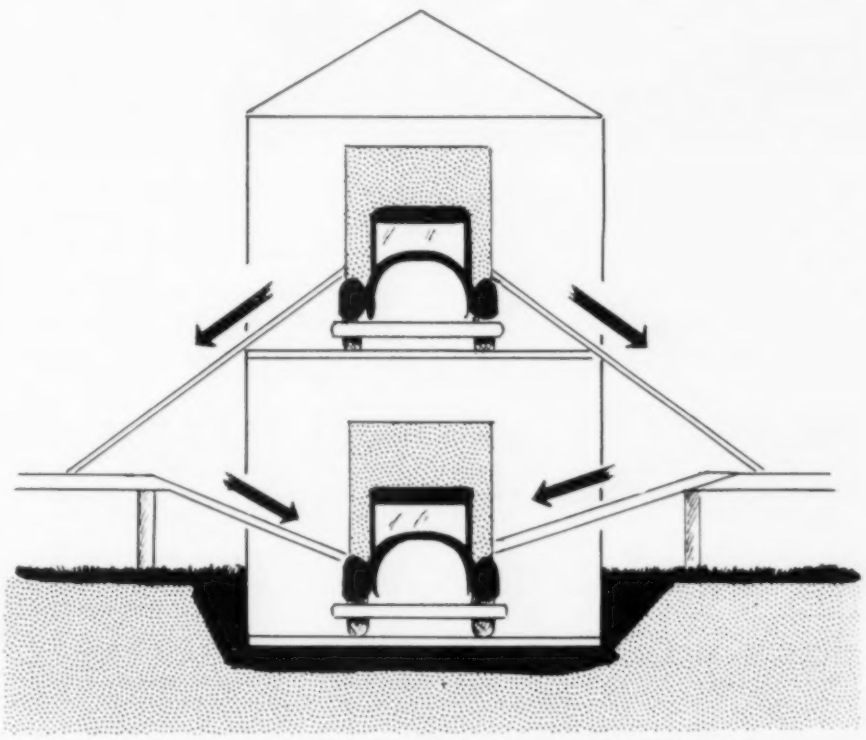
All cities with modern airports should make every attempt to have one of the four above air freight terminals. Even though the two larger types possibly cannot be considered at this time, at least one of the first two can be considered.

The primary thing to keep uppermost in all plans is that air freight moves for one-third to one-fourth the rates of passengers and express. In order to sell air freight in volume the rates have to be kept down. Air freight terminals should have all the bare facilities but no gingerbread. All economies have to be made. Air freight cannot afford all the trimmings that go with the air passenger business.

An operating company should furnish all loading and unloading of aircraft for so much per hundred pounds, with two rates, one for conveyor-loaded merchandise and another rate for fork-lift-loaded machinery.

In order for air freight to be suc-

(Continued on page 41)



ATC type warehouse (top of page) is constructed with floor at truck-body height and is accessible to trucks and aircraft. Gravity-conveyor type terminal (right), permits planes to be loaded and unloaded by gravity, reducing labor costs and handling time.

Double the selling time *Half* the travel time with the plane that gives

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Here's a salesman who has doubled his effective selling time. He covers 350 to 500 miles a day—sells 4 or 5 customers in as many different cities—and still gets home at night!

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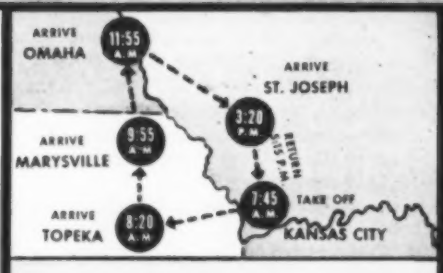
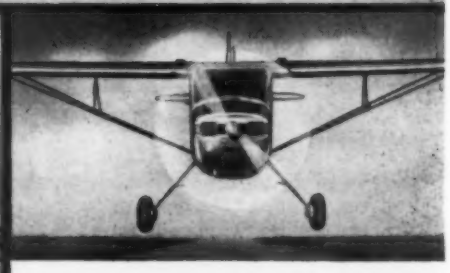


Typical Trip—382 miles, 4 successful selling stops, 3 hrs. 45 min. actual flying time. Two morning calls—lunch with customer in Omaha—a stop at St. Joe—home for dinner, 6 P. M.



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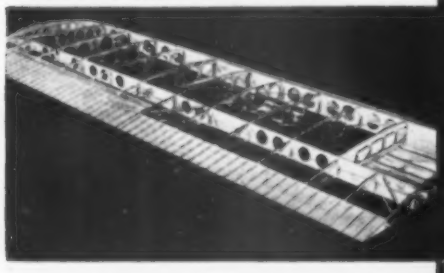

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8 REASONS WHY OPERATORS REPORT INCREASED PROFITS WITH THE CESSNA 120

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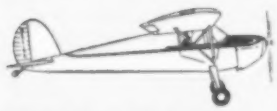

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3 Students prefer this fast, side-by side plane of all-metal structure. You'll have more students more hours per week.

4 Cessna's patented Safety Landing Gear is maintenance-free. Combats ground loops.

5 Students, instructors, operators and buyers all prefer an electric self-starter, which can be added if desired.

6 The Cessna 120 is ideal for cross-country rental or charter work, from 300 to 3,000 miles.

7 Resale value of the 120 is unusually high. It permits frequent profitable turnover of equipment . . . keeps new planes on the line.

8 Teach 'em to fly in the plane they'll buy . . . the Cessna 120—only $2695 (f. o. b. Wichita).

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Aid To Airports From Oil Companies

No Santas, oil suppliers expect a return on their "gifts" — more business through better service and more efficient airport management.

By JOHN H. FREDERICK

THERE has been a good deal of misunderstanding as to what the oil companies will or will not do on the smaller airports. Some prospective airport operators have been under the misapprehension that all they had to do was provide the land with some sort of runways and that the oil companies would then compete for the privilege of building a hangar, an appropriately tasteful administration building and for supplying whatever dispensing equipment might be required. These operators have seen what was done in the building and equipping of automobile service stations and rather expect something similar to happen in the development of smaller airports.

As a matter of fact, the oil companies intend only to do a part of what some have expected of them. There are very good reasons why this is so.

In the first place, the oil companies have been the first to realize that only a comparatively small part of an airport operator's income will come from the sale of petroleum products. Some estimate this to be no greater than 10 to 20 per cent of total sales. In automobile service stations, on the other hand, such sales amount to some 95 per cent of the total in many places.

In the second place, the oil companies intend to move with caution and not tie up large sums of money on scattered airports. It is felt that the present abnormal conditions both in the manufacture and sale of lightplanes and in airport development make it impossible to draw definite conclusions as to what their small airport market may amount to.

A recent survey among the major oil companies reveals that so far their aid to small airport operators has been along these lines:

1. The supplying of oil and gasoline dispensing equipment including underground tanks, pumps and small portable units as business warrants.
2. The promotion of airport building and private flying through what have at times been rather elaborate "public relations" programs.
3. The supplying of sales aids and plans to airport operators handling the products of individual producers.

Oil companies will not underwrite small airport construction costs or finance hangar or other construction costs on those to be built under the national airport plan except in very rare cases and then only on the basis of loans to sound operators at prevailing interest rates and also with the restriction that theirs will be the sole oil products sold on a particular airport for a certain length of time. Under such conditions it is probably wiser to obtain capital elsewhere and this is what the oil companies really want to encourage.

The oil companies feel that their first responsibility in the aviation market is to supply a complete line of products for an airport operator to sell all the way from fuels down to specialized lubricants. Next, they think they should provide the proper dispensing equipment. After these two things are done a great deal depends on the airport operator himself but the oil companies do not leave him entirely to his own devices.

The major oil companies all have rather complete sets of merchandising and sales promotion aids designed to bring pilots to a dealer's airport. These usually include such "hand-out pieces" as navigation computers, rules, log and expense books and the like. Some companies also engage in local advertising or in supplying dealers with mats of advertising copy for insertion in their home-town newspapers. Nearly any company will paint a sign

(Continued on page 33)

$1,000 Bond Urged as Court Requirement to Protect Airports from "Nuisance" Suits

Posting of a $1,000 bond to compensate for court costs and legal fees has been suggested by a California attorney as a legal requirement for court action, based on flight of aircraft, against airports.

"A plaintiff would not be so anxious to bring a suit in abatement if he were compelled to post a bond," commented Claude A. Watson of Los Angeles in a letter to SOUTHERN FLIGHT suggesting the bond requirement be added to flight-of-aircraft legislation proposed in an article last month by John H. Frederick.

In the February article, Author Frederick emphasized the need for state legislation to protect airports, suggesting the aviation industry as a whole sponsor brief, simply-worded bills in all states. He recommended the following proposed bill as an example:

"An act relating to causes of action at law or in equity arising from flight of aircraft over lands and waters of this state. Be it enacted, etc.:

"Section 1. No cause of action at law or in equity based upon flight in aircraft over lands or waters of this state shall be maintained unless other than nominal damage results therefrom, or unless irreparable damage will probably result therefrom.

"Section 2. This act shall take effect immediately."

Attorney Watson suggested the following be incorporated in the above as a new Section 2 (re-designating the old one as Section 3):

"Section 2. In any such action as set forth in Section 1 hereof, the clerk shall, before issuing the summons therein, require a written undertaking on the part of the plaintiff in the sum of $1,000, with at least two competent and sufficient sureties, specifying their occupations and residences to the effect that if the action be dismissed or the defendant recover judgment, that they will pay such costs and charges as may be awarded against the plaintiff by judgment or in the process of the action, or on appeal, not exceeding the sums specified in the undertaking. The defendant shall be entitled to recover a reasonable sum for attorney's fees expended in defending such action. An action brought without filing the undertaking required shall be dismissed."

SOUTHERN FLIGHT recommends that aviation interests everywhere act immediately in submitting such harmless flight-of-aircraft legislation to their respective legislatures. ★ ★ ★

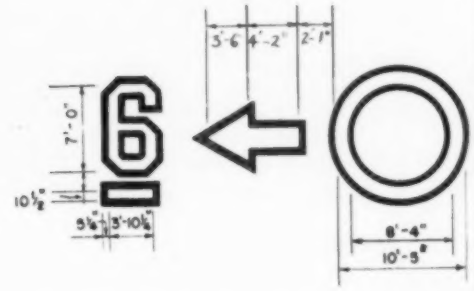
AIRMARK YOUR

With the airport operator furnishing paint and a buffet luncheon, FAPA members and co-operative 99's airmarked Florida's Belvedere airport in four hours. Lay-out men (left, center) finished only 30 seconds ahead of painters. Left to right, standing, Hub Davis, James Galleger, Bruce Yeazel; kneeling, Royal Harber and Vernon Wunnenberg. Air view of marker is at lower left.

COMMUNITIES and states needing air markers are waking up to the fact that the signs, essential to thousands of cross-country fliers, are needed now and will probably have to be provided locally if at all, since Uncle Sam's purse strings are being tightened and the Civil Aeronautics Administration and other agencies are in no position to blanket the nation with painters. Local Civil Air Patrols units, Flying Farmers and others in many areas have already mapped plans for air marking campaigns this Spring.

One of the most effective methods to get the job done and in a hurry was used recently in Florida, where all markers were obliterated during the war in the interest of national defense. Overnight Florida, the nation's most completely airmarked state, became the worst. With peace the state pressed the Federal government to reimburse it for the markers which had been obliterated, but the shortage of funds available to CAA stymied the reconstruction program. Comments William C. Lazarus, aviation supervisor of the Florida State Improvement Commission: "The war has been over more than a year. Several pilots have lost their lives in Florida by becoming lost. In nine months of encouraging local communities and others to restore the markers we have had some success and 52 have been restored, of which 16 were put up by the highway department."

That's progress, but with 1,000 markers as a goal it would take years to do the job at such a pace. Pilots have become enthused over the prospects of speeding up the work and the Florida Air Pilots Association has



STATE

PILOT-PAINTERS putting finishing touches on a Florida roof marker include J. W. Weldon, Tampa Aero Club president; Ruth Hubert, state chairman 99's; Peggy Harrod, FAPA secretary; Dr. H. L. Andersen, FAPA president; Gladys Pennington, Johnson Wright (Belvedere Airport manager), Hub Davis, Pete Hubert and Roy Pennington, FAPA general chairman.

Florida's private fliers decided it was up to them to replace the state's once excellent airmarking system.

By TOM ASHLEY
Managing Editor

undertaken an airmarking program of their own. The group obtains the paint, rounds up a breakfast flight to a selected point and before the sun sets has restored a marker.

How Plan Works

The FAPA method is simple to operate and inexpensive. To restore the marker at Belvedere Airport, West Palm Beach, cost FAPA only $53. Here's how the campaign got under way:

Where to put the first marker and how to go about it were the first problems facing FAPA and its 400 members who hold a student permit or better rating. Johnson Wright, owner and manager of Belvedere, solved the first problem by offering to supply the paint for the restoration of his marker. Moreover, he offered a free buffet luncheon.

The next problem was solved by Lazarus, the state's aviation supervisor, and a member of FAPA. He furnished all the necessary CAA bulletins on airmarkers and personally designed the Belvedere marker without charge (an acceptable design can cost as much as $50) so it would be recognized officially by CAA and thus be included on the air chart. The Belvedere marker was to be painted on two individual hangars, with 19 letters measuring 10 feet high on one hangar — BELVEDERE W. PALM BEACH — and eight numbers five feet high, an arrow 14 feet by 1 foot and a 22-foot circle on the other hangar.

Only one coat of paint was required because the hangar roofs are of tar. This took eight gallons of international orange, costing $28 and donated by the operator. Many members brought their own brushes, but it is estimated the ten paint brushes (both 4-in. and 6-in. sizes) and the chalk and line would cost a total of $25.

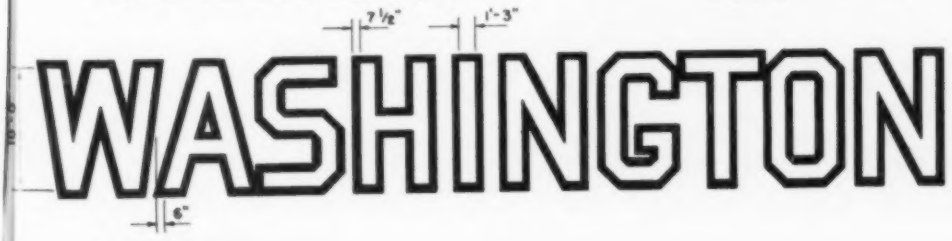
Thirty members of FAPA and some co-operative 99's showed up for the operation, which got under way at 9 a. m. on a Sunday. The operator served coffee and doughnuts to early arrivals and after most of the visiting planes were in three "layout men", with chalk and line, climbed atop the hangars and began marking off the letters and numbers. The design layouts furnished by Lazarus, highly detailed with measurements to insure accuracy and ease of following instructions, were chalked in slightly ahead of the paint crew.

Four hours later the large marker was completed at 1 p. m., the layout men finishing just 30 seconds ahead of the ambitious painters. Airport Manager Wright had meanwhile hustled together the buffet luncheon and it was ready when the workers climbed down from the roofs. By this time 30 planes had landed from all parts of the state and 200 persons had gathered to hear Mayor Hitt of West Palm Beach officially open the airport.

Florida pilots had not only proved their first marker a successful and practical undertaking but had blueprinted an effective method by which pilots everywhere can influence the development of cross-country flying this Spring and Summer. They had demonstrated that airmarking need not be expensive when executed on a co-operative basis, that unskilled painters can do the trick with dispatch once a carefully-prepared design is provided, that entertainment can be provided by combining the chore with breakfast flights and other flying activities, and the Federal government hadn't been called on to spend one dime, the CAA wasn't asked for any personnel or equipment. All that was necessary was (1) an enterprising gathering of private fliers, (2) an alert state aviation supervisor who could provide the design (if your state doesn't have one a competent engineer can do the same by following CAA bulletins giving marker requirements) and (3) an airport manager who was able to provide eight gallons of paint and serve coffee, doughnuts and a buffet luncheon.

Others wishing to combine cross-country flying with something constructive should capitalize on FAPA's idea and schedule marker projects as soon as the weather permits. Mrs. Peggy Harrod, secretary of the Florida Air Pilots Association, Box 148, Riverside Station, Miami 35, will attempt to answer any inquiries from those seeking further information on her group's campaign. ★ ★ ★

Diagram of typical airport marker (below) shows how novice sign-painters can do good air-marking job. Marker shows distance and direction to nearest airport, should also carry latitude and longitude in degrees and minutes. Example is from "Air Marking," CAA bulletin prepared to aid state and local agencies in planning markers.



Thousands of aircraft and engine parts

. . . a million dollars worth . . .

YOU NAME THE PRICE!

I have 7,600 surplus military aircraft of all types, which I am tearing down in order to assemble the largest stockpile of aircraft and engine parts in the country. But I don't aim to keep them. That's why I am tagging them with prices so low you just can't afford to pass them up.

They're going fast — so wire or phone me right away; or better yet, come yourself.

HARRY A. HAMMILL

SHERMAN ENGINE & MACHINE COMPANY
Clinton, Oklahoma

AID TO AIRPORTS

(Continued from page 29)

and directional marker on a hangar and provide a distinctive wind sock.

Nearly all companies realize that one good airport operator in business is better than half a dozen potential dealers of this type. Therefore they provide dealers with advice on their advertising, merchandising, accounting and equipment problems. Some companies try to keep dealers operating successfully by installing accounting systems or at least by supplying forms for daily flight records, daily flight schedules and daily gasoline and oil records.

Most oil companies have also extended their credit card programs to fliers so that such cards are honored for aviation products just as they are for the automobile.

It will be seen, therefore, that except for extensive financing the major oil companies are ready to do everything they can to assist an airport dealer in providing facilities for the service of aircraft similar to the service which has become common-place to the motorist. They believe it is just as important to clean the windshield of an airplane, to check the tires, to check the oil and at the same time be alert to any mechanical difficulties the pilot may not be conscious of as it is to do the same things to an automobile. Service is the keynote to airport success and the oil companies would rather go all out in its development than in financing buildings or other airport improvements which, if supplied by private capital, will in themselves be an incentive to sound operation and merchandising by an operator. ★ ★ ★

2,550 New Airports in CAA's 3-Year Plan for 4,431 Projects

A list of 4,431 airports which it believes should be constructed or improved during the next three years has just been issued by the Civil Aeronautics Administration.

The list, which summarizes the National Airport Plan, includes the 800 projects already announced for the 1947 construction program together with additional projects from which those to be included in the fiscal 1948 construction program will be selected dependent on urgency and the amount of funds appropriated by Congress.

Included in the plan are 2,550 new airports at an estimated cost of $378,900,000, and the improvement of 1,881 existing fields at an estimated cost of $606,900,000. New projects include 153 seaplane bases, 1,708 Class I fields, 530 Class II, 145 Class III and 14 Class IV or above. Projects scheduled for improvement include 11 seaplane bases, 507 Class I airports, 570 Class II, 390 Class III and 403 Class IV or above.

Dollarwise, it is estimated that $435,000,000 in federal and sponsors funds will be required for the 417 large (Class IV or above) airport projects, $548,800,000 for the smaller airport projects, and $2,000,000 for seaplane bases.

Airport locations listed in the plan have been chosen with three factors in mind: (1) airports required to accommodate air traffic generated in the community in which they are located; (2) airports at intervals along natural routes of air travel; and (3) airports located at places that people want to reach by air.

The size of airports proposed, according to CAA, is based on the type of aircraft and volume of traffic expected at the various locations.

Booth Space Available for Airport Exposition

The 1947 American Airport Exposition, sponsored by the American Association of Airport Executives, will be held May 12-15 at the Sherman Hotel, Chicago. Booth space, ranging in price from $150-$300, is now being assigned. Details are available from G. Patrick Moore, chairman, Suite 303, 55 East Washington St., Chicago 2, Ill.

Five States Detail Airport Information in Directories

Airport directories detailing the landing facilities within their borders are now being published by five states —Alabama, Colorado, Louisiana, Missouri and Wisconsin. Others have been announced in the past and more are expected to follow suit in the near future. The directories range all the way from elaborate illustrated booklets to simple mimeographed sheets.

The most extensive job is that being done by the State of Missouri, which publishes both a directory in booklet form and a state aeronautical chart. The directory lists the facilities available at each airport, both for the airplane and the pilot, and includes aerial photographs of many of the fields.

Wisconsin has offset its directory on a double page with the airports listed alphabetically by location on the left, and an airport map on the right. Information included for each airport consists of airport name, distance and direction from the city or town, manager, longest runway, facilities available and telephone number.

The Louisiana directory is mimeographed but includes far more information than most. Listed in separate columns are the name of the town, airport and manager; airport class; location; chart and elevation; description of runways; runway surface; availability of hangar space; gas and repair facilities available; obstructions; operators on the field and remarks such as beacon and runway lights or closed to private planes.

The Alabama directory likewise mimeographed, is primarily a personnel list, giving name of town, name of airport, type of field, name of manager, and names of base operators. No information as to class, length of runways, location or facilities available is included.

Colorado has included its directory, current as of July 1, 1946, in an Aviation Development Survey prepared by the University of Colorado Bureau of Business Research. Present landing facilities are detailed both in list and map form, as are proposed facilities under three phases of an aviation development program.

Inwood New Aviation Director for K. C.

Louis R. Inwood, former TWA executive, has assumed duties as city aviation director for Kansas City, Mo. His 20 years of experience in aviation includes operation of his own flight school and repair base, aircraft sales, promotional activities for non-scheduled aviation, government advisory service to Congress, the CAA and the Air Safety Board. Inwood left TWA last January when he declined foreign service.

Hangar with Revolving Floor Offered by Firm

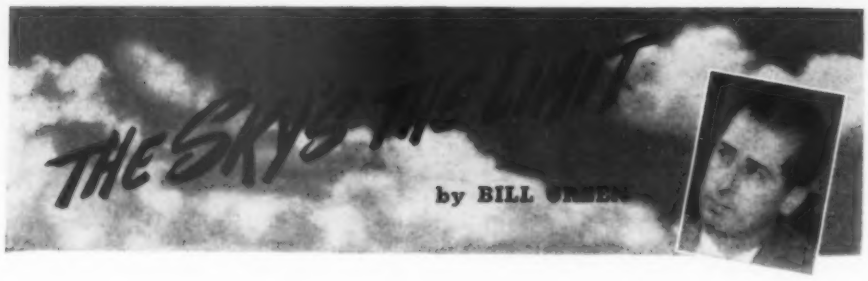
A new solution to the individual hangar problem is being offered by the Roto-Hangar Co., Los Angeles, in the form of a pie-shaped hangar with a revolving floor. The hangar is divided into six stalls by steel mesh partitions, and has only one set of doors. The revolving floor or turntable is operated by a ¾-hp. electric motor, and has a push-button control system by which any stall can be brought to the door position.

Principal advantage claimed for the Roto-Hangar is that it saves two-thirds of the land area required by the conventional T-hangar, yet gives each aircraft all the protection of individual hangaring.

The Roto-Hangar is 84 ft. in diameter, and each stall is 40 ft. wide at the front, 40 ft. deep, and 11 ft. wide at the back. The entire structure is framed of steel members covered with 26-gauge corrugated steel. It is shop fabricated and erected by crews furnished by the manufacturer.

More Planes Staked Out Than Hangar-Stored

Eighteen of 22 state directors of aviation reported there were more private planes staked out in the open than were in hangars, according to a survey letter circulated by J. C. Rasmussen of Airport Equipment Corp., Chicago. His company is marketing new Hercules factory-built T-hangar structures for local covering. Dimensions of the units are 42 x 28 x 10 ft.



Too Many "Middlemen" in Aviation

WE have had a lot of misgivings lately about the prices at which manufacturers are selling private aircraft. Of course, we believe very strongly in the profit motive ourselves and will not willingly engage in any piece of business in which a good profit is not in sight. Nor do we think anyone else should. It is impossible to render good service and to give rebates and free customer service afterwards, if required, unless one has made a substantial profit.

On the other hand, when an airplane comes out with an advertised price of $3,000 and then goes up to $3,600, and before it gets through, the price is $5,600 for a two-place airplane that isn't very big, shouldn't cost that much and doesn't perform in ratio with the price, then we think something is wrong. When people come out and save several hundred dollars in the production of an airplane above previous prices, but still have to charge $3,000 more for it than they anticipated in the first place, there has to be something wrong.

We do not believe that all of this comes from increased manufacturing or material costs. We believe it is largely due to lack of efficiency. This comes from improper attitude on the part of company officials and on down the line. We had orders in for two of the sleek, new, postwar airplanes, both of which have now raised their prices before we have gotten anywhere near delivery date. One of them raised his price so substantially that it prohibits our purchasing that airplane. That is going to be true in a lot of other places and is going to prevent these manufacturers from getting the mass market they wanted.

We don't know exactly what the answer is, but we have observed in one or two airplane plants that they are not efficient—there are hordes of people standing or sitting around who are not having any considerable effect upon the manufacture of the airplane or anything else, except the ultimate cost to the consumer. Since the sales agencies usually receive a percentage of the sales price, they actually wind up by getting a percentage of the inefficient extra burden of cost added to airplanes by those people, thus further increasing the cost to the ultimate consumer and taking it clear out of range of most of us.

We think there are certain evident facts that should be considered by all manufacturers and others interested in the creation of a large private plane market. The average person in the United States cannot afford an airplane that costs in excess of the price of a moderate-priced automobile. Certainly he cannot afford to maintain and operate both an automobile and an airplane. Obviously, there is a class of people receiving incomes above this normal and those people could afford to own both a moderate-priced automobile and a moderate-priced airplane that should not exceed $2,000 in first cost. It is obvious, also, that the average airplane does not weigh as much as the average automobile, does not have any more parts, and the materials are no more expensive than those in an average automobile.

Why Costs Are High

The cost of aircraft is high because: 1. Hand labor is used to a considerable extent, inasmuch as designs have not yet arrived at the point where they can be mass-machine-produced. 2. Aircraft plants have not arrived at the efficiency of automobile plants. 3. The airplane plants have not had the large income over a period of years that would be required to thoroughly tool up to achieve the ultimate in manufacturing efficiency.

With the present high prices of airplanes, they never will reach that mass market and mass income required to achieve the efficiency and low prices they need. It is a vicious and endless circle.

We were interested the other day to read in Fortune magazine the story of Republic Aviation, in which it was mentioned that some thirty-five Republic Rainbows would be sold and delivered before the company reached the break-even mark. After that, if they sold a few more Rainbows, they might expect a profit. These ships would deliver for a price in excess of $1,250,000. Obviously, there are not many people who can buy those airplanes and the chances are that fewer than one hundred of them will ever be sold. We well remember the story on the original Douglas DC-2 in which they had to deliver some eighty-five of those airplanes before they reached the break-even mark. Since the airplanes delivered for something over $100,000, they took a very long chance, both in the design and in the manufacture.

When we get to thinking about this whole business of price on airplanes, we remember that we once bought a C-34 Cessna airplane for $4,995 at a time when the selling agency received $1,000 sales commission per C-34. This meant the Cessna Aircraft Company manufactured that four-place airplane at a profit for $3,995, of which they paid a terrific portion to Mr. Warner for his 145-hp. engine. Engines cost a great deal less now than they did then, regardless of increased manufacturing costs. They are more easily installed and come with less-expensive accessories. Cessna gradually got up to the point immediately before the war where that same Airmaster, with a slightly larger engine, but otherwise very similar, was selling for something in excess of $7,000, probably with about the same commission to the salesmen and probably with about the same profit to Cessna. However, although Cessna sold about 400 of the Airmaster model between 1934 and 1941, they had never achieved what would be called mass production by any stretch of the imagination.

We have seen Cessna's plant since Models 120 and 140 started coming out and we believe they are about as close to achieving mass-production efficiency and economy on that model as anything that we have seen, and their prices are low considering that a good part of the equipment, engine, etc., have to be purchased from other people, who have not necessarily achieved that efficiency.

We suspect that there are too many "middlemen" in the aviation business for the ultimate low price that is required, and these people extract too high a profit percentage-wise off of too low a volume of sales.

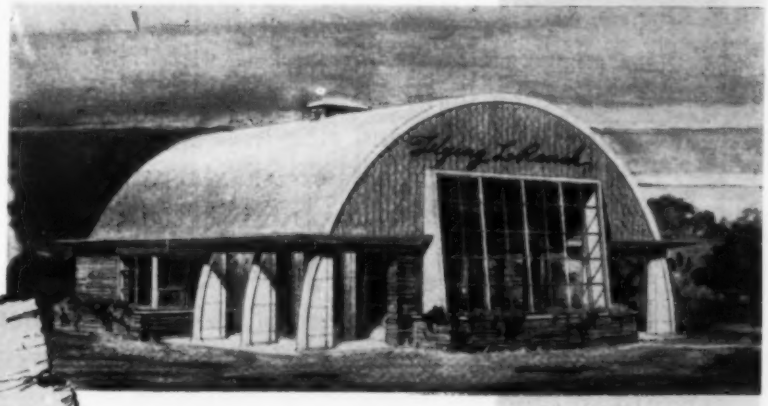
Until this is cured, we see no way for the aviation price structure to be lowered materially because these people are getting the lion's share of whatever aviation dollars are spent. This may be heresy—we are likely to receive a bomb or two in our next mail. But we won't even bother to open it.

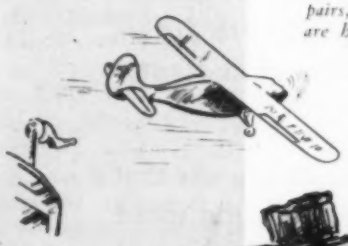
Sometimes, we suffer from too much help and not from too little. It seems to us that if the aviation trades associations would put their heads together, become realistic, and get a horde of middlemen out of the aviation picture (let them start competing with filling-station operators, hardware stores, automotive accessories, or something else) — they could probably whittle off the cost of small aircraft. They could, without impairing the profit to the manufacturer or the servicemen, get it down to the point where average Americans could afford at least several times more than they now can buy. ★ ★ ★

Spring Tonic

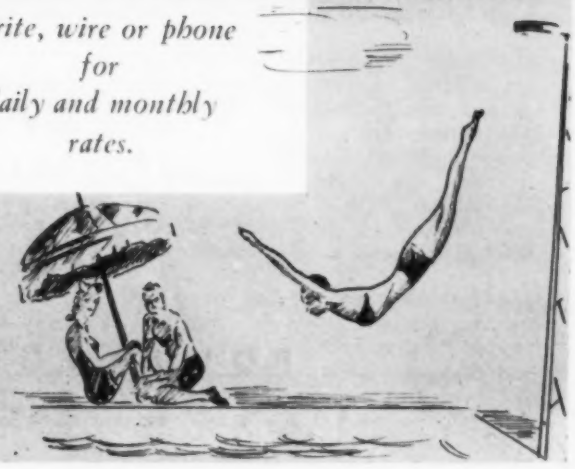
THE WEATHER'S just right . . the accent is on pleasure . . at the FLYING L RANCH, first of its kind in an aviation-conscious world. Located in Texas' scenic hill country, in the dude ranch center of the great Southwest. Complete is the word for it . . 550 acres of resort providing everything for your pleasure and comfort . . an old-time ranch, registered cattle . . a modern dude ranch . . excellent airport . . accredited flying school . . a model playground and rest haven. . . WHAT DO you prefer? Deer, wild turkey, duck in season . . scrappy black bass challenging you from the shadows of three nearby lakes . . saddle horses . . a glistening swimming pool under the cool oak trees . . a modern night club . . or the best dog-gone loafing a Texas sun can inspire. . . BROWSE AROUND the colorful shops and shrines of historic San Antonio, only 32 miles way . . or do the "Cotton Eye Joe" and "Put Your Little Foot" at a western honky-tonk in nearby Bandera. The Flying L also will arrange guided week-end flights to old border towns of the Rio Grande and other points of your choosing. . . LIFE is swell at the Flying L. Bring your family . . set your own pace . . at the big ranch house or in the new guest cottages. Cottages have private bath with each bedroom, wood-burning fireplace in the living room, shaded patio. . . STIMULATING climate . . wonderful cooking . . genuine hospitality . . unobtrusive service . . these await you the moment your wheels touch and the familiar "Follow me" jeep guides you to the ramp.

The Airpark's runways are 2,800' and 2,500'. Gas and oil, service, storage, repairs, transportation are handily available.





Write, wire or phone for daily and monthly rates.



GREATER MARGIN OF POWER FOR AIRLINE OPERATION

With New 2500 *Horsepower* *Wright* CYCLONE 18BD

★

THE WRIGHT AERONAUTICAL CORPORATION announces a new, post-war commercial aircraft engine, the 2500 horsepower CYCLONE 18BD as the next step in the development of "Power for Air Progress."

> *This new model, now in production for the new Lockheed Constellation, incorporates many advancements to provide greater power and reliability in airline operation.*

The increase in horsepower to 2500 makes the CYCLONE 18BD the most powerful 18 cylinder engine in the world. Among its many new design features are a *Cylinjector system*—the direct injection of fuel into each cylinder; *low tension ignition* for improved performance at altitude; *piston oil jets* for prolonged piston and ring life; *forged aluminum cylinder heads with differential finning* for greater cylinder strength and improved cooling; and *automatic spark advance* for cruising economy.

Although it is a direct descendant of the earlier CYCLONE 18 engines that have broken 98 world records for long distance, altitude with load, and speed with load, the CYCLONE 18BD is the newest model specifically engineered by Wright for commercial transports.

WRIGHT
AERONAUTICAL CORPORATION
WOOD-RIDGE, NEW JERSEY
A DIVISION OF
CURTISS WRIGHT
FIRST IN FLIGHT

POWER FOR AIR PROGRESS

SIGNS IN THE SKY

(Continued from page 19)

practice, skillful flying and timing. Gregg says he counts so much upstairs that he finds himself counting in his sleep.

Night Signs and Color Work

It's true that most of the novelty has worn off single-plane skywriting. But the boys with the Skywriting Corporation aren't napping. To attract more attention to their art they've got a nifty bag of tricks almost ready, including gleaming pink luminous vapor for nighttime work and bright orange, blue, red and brown colored vapor for daytime signs.

Already they have worked out a two-plane technique which is being used now on the East and West coasts. Both planes work on a single sign simultaneously, sometimes on the same letter, sometimes one ahead of the other. This calls for technique and a sharp eye to avoid collisions.

In San Diego a few months ago Jim Gregg and a fellow skywriter named Tommy Campbell decided to give their spectators an extra thrill during their two-plane skywriting stints. While awed thousands watched from the ground, their planes approached nearly at right angles, seemingly at the same altitude while making the A in "Pepsi Cola." Then, as a collision seemed inevitable, one plane passed over the other at a none-too-safe fifty feet. It definitely wasn't a healthy stunt, but it was good showmanship.

Something New Under the Sun

Last November in a spectacular air show over Manhattan in New York, seven planes drew out a gigantic "Pepsi Cola" sign. Now the Skywriting Corporation, headed by S. S. Pike, is working out plans for a nine-plane formation that will completely change sky-scribbling technique. They've already purchased fourteen AT-6's for the job.

Under present plans nine planes will fly abreast in close straight formation. The key ship will be the right or left wingman. He will control the vapor streams in all nine planes with a special radio apparatus being made by Bendix. The electronic gadget, of course, is very hush-hush. The other pilots, meanwhile, will be concerned only with holding that straight formation.

If the pilot in the key ship wants to write L, for instance, he briefly switches on the vapor in all nine planes. This will leave a straight line of short puffs which will nearly blend together, making the back of the L. Vapor will continue to flow from the plane on the extreme right, streaking out the base of the letter. In this manner an entire sign will be written in the sky in perhaps a minute or less, with plenty of attention being attracted by the roar of nine engines.

The nine-plane formation will be employed primarily in the heavily populated areas of the East where millions will see the signs rolled out during a single flight. They expect to cover not one, but eight cities per jaunt, New York City, Newark, Philadelphia, Chester, Pa., Wilmington, Del., Baltimore and Washington, D. C. It will be something new under the sun.

This expansion program means that skywriting is blooming into a big business. Already the company is said to be doing a half-million-dollar business annually, and the sky is no limit for the skywriters.

Sometimes Gregg and his fellow fliers are approached by well-meaning young men who want the girl friend's name written in the sky as a magnificent gesture of their affection. Needless to say, such requests are politely rejected. It takes a great deal of practice to get any sign down pat, so the expense would be prohibitive for a single writing. Skywriters don't talk in terms of single signs, but in numbers ranging upward into the thousands. The cost, of course, is graduated down the scale as the number of signs increases.

The first sign written in this country was "Hello USA," spun out by Capt. Cyril Turner. He followed with, "Call Vanderbilt 7200," the firm's number, which flooded the temporary offices with telephone calls for the next five hours. It was the beginning of a new and profitable medium of advertising in the United States. ★ ★ ★

Newspapers rushed by truck to airport are delivered by Noorduyn and other trucks to enable subscribers in 54 South Texas cities to read same edition at same time as city subscribers in San Antonio.
—(SOUTHERN FLIGHT Photo.)

AIR MAIL FOR FLYING NEWSBOY?

EIGHT months of daily "flying newsboy" operations for the San Antonio Evening News and Express by four UC-64A Noorduyns have been described to the Civil Aeronautics Board in an air mail application proposing mail service to 54 South Texas communities through its combination plane and truck newspaper deliveries.

Operating under the name of "Airnews, Inc.," the applicant seeks a non-subsidy mail pay rate of 10 cents per airplane mile with no charge for its truck service, and offers to add multi-engine equipment and night service if certificated.

The use of Noorduyns in combination with the newspapers' trucks has enabled subscribers in the 54 cities to read the same editions of the newspapers at the same time they are delivered to San Antonio subscribers. Greatest distance reached is 300 miles (San Antonio to Brownsville), which, with intermediate stops at Laredo and McAllen on the Mexican border, takes 3 hours and 5 minutes. When the Noorduyns are grounded by weather, delivery is by truck all the way, but in eight months the trucks have taken over on two occasions only. With these exceptions, Airnews says it has completed every trip within 15 minutes of scheduled time.

Return flights are utilized to haul fresh shrimp and freshly-ground coffee into San Antonio from Corpus Christi. Fresh citrus and produce from the Rio Grande Valley will soon be carried as return cargo. Charges average 30 cents per ton mile for the short hauls. Airnews says its Noorduyn direct operating expense has averaged 22 cents per mile over approximately 27,000 miles flown per month. ★ ★ ★

IT was a big moment for Beech Distributor Jim Gray (above) when he parked Texas' first Bonanza in front of the Love Field offices of Dallas Aircraft Sales. Distributors picked up demonstrators when the factory began deliveries in mid-February.

In a check with four passengers, Gray's demonstrator climbed 1,000 feet during the first minute after take-off, using 2,200 rpm., 25 in. of manifold pressure and a 98 mph. climb attitude. Cruising speed at 2,500 feet was 157 mph. indicated — or approximately 162 mph. true air speed — and was obtained at 2,050 rpm. and 23 inches of manifold. Pulled up from cruise at 2,800 feet, the V-tailed Beech reached 5,000 feet in one minute. With flaps and wheels down, the Bonanza stalled power-off at 55 mph. indicated, demonstrating excellent stability common to many postwar planes. Gear is lowered at 100 mph. on landing approaches and 80 mph. is recommended for the straight-away. In flight the 165-hp. low-wing plane reacts to feather-light control pressures, needs no rudder pressure in gentle banks, does require plenty of rudder in climbs. New-comers will find it an easy plane to fly once cockpit procedure is mastered. A check-off list would minimize this problem.

The Beech factory, after subjecting the Bonanza's component parts to an equivalent of 20,000 hours of flying and 100,000 landings, began pushing production (below) to satisfy a backlog of 1,500 orders. The sales price has been increased from $7,345, as advertised, to $7,975 as of January 31. — J. J.

OPEN TH' THROTTLE

(Continued from page 21)

these forces are balanced only at one speed and power setting. High-powered airplanes are provided with trim tabs so that the forces can be adjusted to balance at different speeds and power settings.

How Power Alters Trim

In any airplane, you should be prepared for the changes which occur when you alter the throttle setting or the speed. If you do not anticipate these changes in advance, some airplanes will get out of control. Here is what happens:

1. When you open the throttle, the nose will tend to swing to the left.
2. When you decrease the air speed, the nose will tend to swing to the left.
3. When you close the throttle, the nose will tend to swing to the right.
4. When you increase the air speed the nose will tend to swing to the right.
5. When you open the throttle, the nose will tend to rise.
6. As the speed increases, the nose will tend to rise.
7. When you close the throttle the nose will tend to drop.
8. When you decrease the speed, the nose will tend to drop.

You can see that some of these tendencies "pair off" — adding to, or detracting from each other. In a climb, you have 1 and 2 added together, making it necessary for you to hold right rudder to keep the airplane on a straight course, or even in a turn to the left to keep it from turning too sharply. In a glide, 2 may partially cancel out 3, but in a dive, 4 will definitely make it necessary for you to hold left rudder.

Whenever you find it necessary to open the throttle rapidly, remember 5. A friend of mine was killed because he forgot to relax back pressure on the stick when he gave her the gun suddenly.

As a final word let me warn you against the common fault of opening the throttle part way and stopping before you have all the power you need, and then opening it the rest of the way. Many students do this under the impression that they are going easy on the engine. When you do this on take-off, you are just wasting runway—on a small field this may be fatal. Open the throttle smoothly, but open it to the power setting you need as soon as possible. This applies double when in doubt whether you may land short or fail to clear some obstruction.

After all, it is no disgrace to use power. That's what it is for. ★ ★ ★

Presenting America's first personal "cargo" plane

Flying businessman prepares to take off from company runway in his Stinson Flying Station Wagon to cover his 3-state sales territory.

...the new STINSON "Flying Station Wagon"!

NOW, FOR '47, Stinson presents *another* outstanding *21st Anniversary* plane in addition to the luxurious 4-place Voyager.

The second thrilling new plane is the husky Stinson Flying Station Wagon—America's first "workhorse" personal plane—a "fly-anywhere" plane with all the comfort features, dependability, and inherent stability of the famed Voyager.

Like the Voyager, this new Stinson is . . .

a proved personal plane—improved for '47!

If you're a flying businessman, you'll welcome this superb carry-all plane.

If you're a farmer or rancher, the Flying Station Wagon is just what you need for hurry-up trips to get equipment parts and other "needed-now" supplies. And on vacation, hunting, or fishing trips, there's room for all the duffle you'll want to take along. Rear seats readily replaceable to make it a four-place plane.

It carries a useful load of 1006 lbs. Cruises at 125 m. p. h. Maximum speed, 133 m. p. h. Take-off run, only 620 ft. Rate of climb, 650 f. p. m. Service ceiling, 13,000 ft. Stops in 290 ft. after landing.

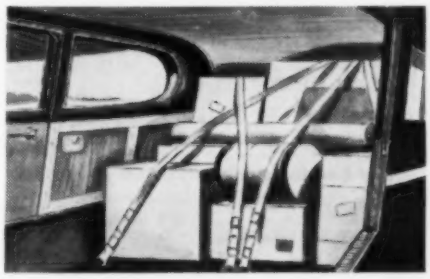
Flaps for quick take-offs and slow, short landings. Built-in wing slots for safety. Inherently spin resistant. Two-way radio, with dome loud-speaker. Starter, hydraulic brakes, soundproofed cabin, and many other de luxe features.

See your Stinson dealer—today. Fly the new Flying Station Wagon—learn how easily you can buy it—how economical it is to own.

Write for illustrated brochure to Stinson Division, Consolidated Vultee Aircraft Corporation, Wayne, Michigan.

Stinson

FOR 21 YEARS—AMERICA'S GREATEST NAME IN PERSONAL PLANES



The Stinson Flying Station Wagon is your own personal "cargo" plane! Reinforced cargo compartment (24 cu. ft.) in 2-tone plywood paneling, equipped with tie-down straps. Cargo capacity: pilot and 600 cargo pounds, or pilot, 1 passenger, and 500 cargo pounds. The two rear seats can be replaced in 5 minutes' time.

A SALUTE

TO THE HUMBLE DEALERS ON THE HUMBLE-ESSO FLYWAY

At these fine Airports throughout Texas, you'll find outstanding service and Humble-Esso 80-Clear, the gasoline that gives you increased power and smooth performance with low maintenance costs. You'll find it second to none in its price class. Wherever you fly, look for the Humble-Esso Sign.

HUMBLE OIL & REFINING COMPANY

DEALER	TOWN
City of Abilene	Abilene
Albany Flying Service	Albany
Knolle Flying Service	Alice
Sky Harbor Aero	Anahuac
Lucas Field	Arlington
F. R. Haile, Haile Flying Service	Austin
Belton Airport	Belton
Bewick Flying Service	Big Lake
U & S Flying Service	Big Spring
Big Spring Municipal Airport	Big Spring
Breckenridge Flying Service	Breckenridge
Frontier Airmotive, Inc.	Brownsville
Border Aircraft Service	Brownsville
Brownwood Municipal	Brownwood
Coleman Flying School	Coleman
City of Corpus Christi	Corpus Christi
Crane County Airport	Crane
Southwest Airmotive	Dallas
Jacobs Aviation Co.	Dallas
Clearview Airport	Dallas
Denver City Municipal	Denver City
Hall Flying Service	Eagle Pass
Martin Flying Service	El Campo
Eagle Field	Fairfield
Pecos County Airways	Fort Stockton
Globe Aircraft Corporation	Fort Worth
Aero Enterprises	Fort Worth
Skyview Airport	Fort Worth
A. C. Flying Service	Galveston
Lynch-Parrish Aircraft Service Inc.	Galveston
Luscombe Airplane Corp.	Garland (Dallas

DEALER	TOWN
Tri-Cities Airport	Goose Creek
Howard Humphrey	Goose Creek
Aero Enterprises, Inc.	Graham
Rutherford Flying Service	Greenville
Ferguson Aviation	Harlingen
Byrn's Sky Ranch	Hillsboro
Sky Travel, Inc.	Houston
Boynton Flying Service	Houston
Cliff Hyde Flying Service	Houston
Erwin-Newman Co.	Houston
Minor Stewart Airport	Houston
Sportsman's Field	Houston
Sam Houston Airport	Huntsville
Iraan Airport	Iraan
Jacksonville Flying Service	Jacksonville
Kermit Aero Service	Kermit
Kerrville Flying Service	Kerrville
Gulf Coast Flying Service	Kingsville
International Aircraft Sales	Laredo
Frank Hogg Airport	Lamesa
Lufkin Flying Service	Lufkin
South Texas Aero Dusting Co.	McAllen
Ralph Stephens	Marlin
McCreary Aviation Company	Mercedes
Mexia Flying Service, Inc.	Mexia
Midland Commercial Airport	Midland
Wisener Bros.	Mineola
Hopson Putz Air Service	Mission
Monahans Municipal Airport	Monahans
E. T. Crawford Flying Service	Nacogdoches

DEALER	TOWN
Bowles & Tilbert	New Braunfels
Mayhew Aerial Service	Olney
Brownair, Inc.	Orange
R. L. Tanner	Port Lavaca
Gorman Fox	Raymondville
Lane Airpark	Rosenberg
Saginaw Airport	Saginaw
San Angelo Municipal Airport	San Angelo
Williams Aircraft	San Antonio
Air Terminal Service	San Antonio
Monroe-Witt Flying Service	San Antonio
Davis Airport	San Antonio
Schulenberg Airport	Schulenberg
Silver Dollar Flying Service	Seguin
Seminole Flying Service	Seminole
Seymour Flying Service	Seymour
Frank W. Churchill Flying Service	Smithville
Jones & Ogden	Stowell-Winnie
W. J. Worsham	Taft
Gage Field	Teague
Reed's Air Service	Temple
Mathew Wallace	Terrell
Gulf Coast Airport	Texas City-LaMarque
City of Tyler	Tyler
Carter Flying Service	Velasco-Freeport
Jack V. Newland	Waco
David Setter	Weslaco
Wharton Municipal Airport	Wharton
Stoddard Aero Service	Wink
J & W Flying Service	Winter

Revving Up

SUBSIDY FOR LIGHTPLANE DESIGNS? The oft-recurring suggestion of government subsidy for lightplane developmental research was revived again at the recent Institute of Aeronautical Sciences 15th annual meeting by William A. M. Burden, assistant secretary of commerce. But this time the industry promptly indicated it would endorse the suggestion—a statement by the Aircraft Industries Association's Personal Aircraft Council chairman, John W. Friedlander, was made the same day assuring Burden and the CAA of the industry's willingness to confer with CAA, NACA and Army and Navy engineers to evaluate the need and outlook for research.

Burden's suggestion for U. S. funds followed his review of lightplane needs including greater utility, lower prices, less noise, increased performance, cross-wind landing gear, lower maintenance costs, fireproofing and more simplified flight and engine controls. Pointing to the recent sharp decline in lightplane deliveries and cessation of manufacture by some, Burden commented: "It seems very unlikely that this phenomenon can be attributed entirely to a seasonal trend. In fact there is a widespread feeling that the decline, in part at least, is due to a feeling on the part of the customers that many of the personal aircraft of today do not meet their requirements."

TEX RANKIN DEAD: Thirty years of flying, which included probably more aerobatic flying and racing than done by any one American and the training of 10,000 pilots, were ended on February 23 by the death of John Gilbert (Tex) Rankin in an amphibian accident at Klamath Falls, Ore. Head of Rankin Aviation Industries at Tulare, Calif., he served overseas during World War I and attempted to enter World War II as a P-38 combat pilot. Respected by many as "the man who wrote the book" on aerobatics, Tex operated one of the nation's leading civilian contract school systems for military flight training.

TARGET FOR TOMORROW: Those who take lightly the occasional complaints of property owners alleging airport nuisances are finding such anti-airport feelings becoming not only widespread but a serious problem. Among the latest cases of anti-airport action took F. C. Nagle and Charles Orr into court in Dallas after two property owners erected flagpoles considered to be hazardous obstacles near one end of their Skyline Airport, Dallas' busiest private field. The judge decided against them, contending the flagpoles were not a hazard and denying an injunction which would force removal of the obstacles. Those who plan new airports should obtain easements to protect their approaches if purchase of additional land is impractical. After a "patriotic" neighbor puts up a flagpole or builds a barn is too late—by then the flagpole becomes expensive and the barn a "mansion." ★ ★ ★

Airmen's Calendar

March 8-9—Festival of States Air Show, Pinellas Airport, St. Petersburg, Fla.

March 19-20 — Third Region CAA Aviation Clinic, Congress Hotel, Chicago, Ill.

March 25—Florida Aviation Trades Association meeting, Daytona Beach, Fla.

March 26—2nd Region CAA meeting with operators, Daytona Beach, Fla.

March 27-29—Third Annual Forum, American Helicopter Society, Inc., Philadelphia, Pa.

April 16-22—Third International Air Service Exhibition, The Hague, Holland.

May 12-15 — American Association of Airport Executives Convention, Chicago, Ill.

May 26-29 — Aviation Meeting, American Society of Mechanical Engineers, Los Angeles.

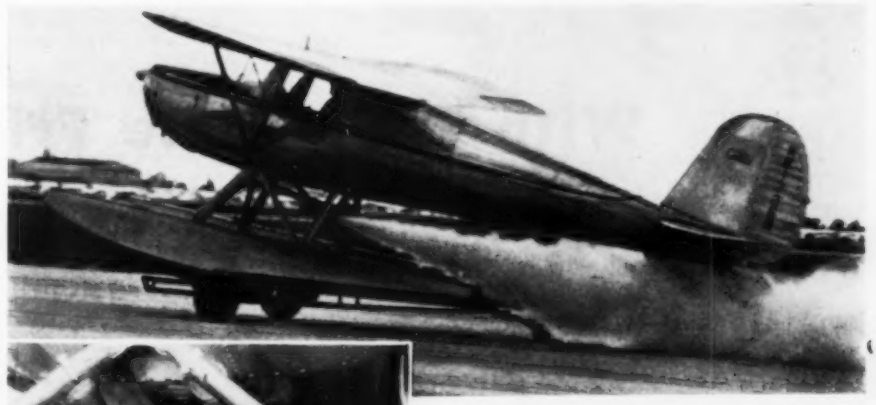
TERMINAL FACILITIES

(Continued from page 27)

cessful every economy has to be made by having all carriers use the same facilities and equipment. Such economies as common maintenance facilities and gas trucks can and should be a part of all air freight terminal facilities.

Air freight is here today, but it will only grow and expand as long as we who are in it keep our costs down, thereby keeping rates down, and at the same time give a service which is air freight in all that the name implies. Watching costs cannot be stressed too much.

Air commerce or the movement of freight by air has tremendous advantages to any city or community whether industrial or agricultural. Our future business is going to be influenced more and more by air freight. The value to communities of this new method of transportation is tremendous. Don't overlook air freight possibilities in your city. Business is now using this service and needs more of it. ★ ★ ★



JET ASSIST FOR LIGHTPLANES has been demonstrated by Maj. Bob Fogg of Edo Aircraft Corp., to show the possibility of flying a floatplane direct from the land base where float installation is made to its permanent home at a waterside floatplane base, thus eliminating the necessity for disassembling the aircraft and shipping it to a float base for re-assembly. Photo shows Cessna Model 140 installation of 40-lb. Jato units, each developing up to 142 hp. at 50 mph. They are fired at an interval of three seconds to prolong the boost and reduce initial acceleration. Land take-offs on floats usually require wet grass, but such "greasing" is eliminated by Jato. Dolly shown in photo was used in Fogg's Miami demonstration because of field's roughness and availability of runway.

—(Edo Photos.)

With Task Force Frigid . . . on the Top of the World

On duty with Task Force Frigid, a Fairchild Packet recently disgorged a Helicopter—ready to fly in a few hours.

Part of a series of cold weather tests being conducted in Alaska, it was all in a day's work to the versatile Packet, pack horse of the nation's fast-moving Air and Ground Forces.

This Fairchild design has opened a new channel of military strategy—complete, fast, air-transport of guns, ammunition, vehicles, supplies and men. And it's doing this *now* for an army that hasn't time to travel by land.

It rushes battalions of paratroopers to objectives, dropping them in compact combat groups.

It's a flying troop train for Air-transported Infantry and Artillery Battalions.

It's transformed in a few minutes into a huge flying ambulance for swiftly transporting as many as 34 litter cases and four attendants.

Designed specifically to carry military cargo, The Packet is another Fairchild example of "the touch of tomorrow in the planes of today."

Fairchild Aircraft

Division of Fairchild Engine & Airplane Corporation, Hagerstown, Maryland

SHORT-CUT TO SERVICE

By AL HARTING

A pioneering step in aviation sales and service, this sub-distributor plan puts parts and accessories within easy reach of private fliers.

THE story of Abilene Aviation Company is proof positive that aviation sales and service can profitably use lessons learned from the automotive industry. Located on the muncipal airport at Abilene, Texas, deep in the heart of the T-bone and mesquite belt, the Abilene firm is patterned closely after the booming Chevrolet agencies in which its two major owners made their business marks.

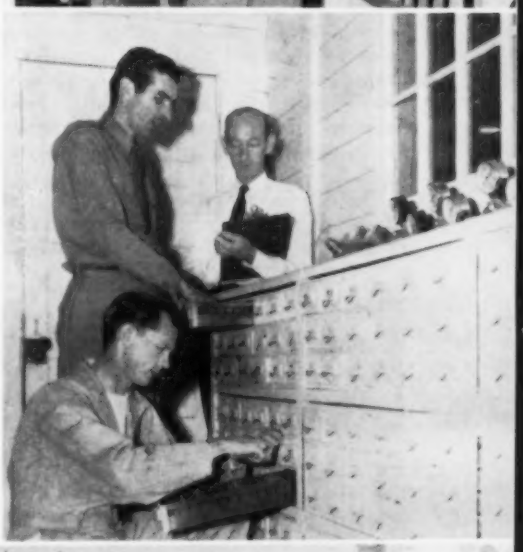
Behind this story are Jack Hughes, private flier and owner of two thriving automobile companies, and H. S. (Hig) Higginbotham, also a private pilot and former right-hand man in Hughes' Chevrolet sales and service organization. Taking their lesson from the doctrine of General Motors, these two AAC executives have proved that well-kept books and files pay off in dollars and cents for the company and customer alike.

The firm's parts and accessories department is headed by a 28-year-old ex-GI, Hobby Frazer, who was a former employe at Hughes' Western Chevrolet Company in Abilene. Service manager is D. B. Guthrie, an A & E with 15 years experience as an automobile mechanic and technician. Frazer and Guthrie are also private pilots.

Merchandise Always on Hand

Aviation supply, Hughes and Higginbotham quickly learned, left much to be desired. Parts had to be ordered from major warehouses and private fliers often had to wait for long periods. The new firm's officials saw the aviation parts situation was strikingly similar to the early days of automobile sales and servicing. "The car business never did get on its feet," Hughes explains, "until the country was organized and brought into a closely-knit system through which merchandise was funneled direct to the user."

To get this kind of service for his



Set-up for service. Top, E. E. Chapman (left) and Jack Sherman (center), both of Southwest Airmotive, check stock cards with Hobby Frazer, parts manager for Abilene Aviation Company. These three, shown inventorying AAC's stock in the next two pictures, worked closely together in preparing the Abilene firm for its role as a sub-distributor. Below, left, H. S. (Hig) Higginbotham, manager of AAC, and Sales Manager Paul Kennedy of Southwest Airmotive inspect a carburetor in the stock room. C. J. Collier (below, center) founded Abilene Aviation Company and is present director of its flight school. Fledgling pilots, after their first solo, must forfeit parts of their shirt-tails. Sixteen-year-old Norma Hughes (lower right), daughter of AAC's owner, was no exception.

—(Southwest Airmotive Photos.)

customers, Hughes called in George W. Jalonick, III, sales division chief for Southwest Airmotive of Dallas, Texas. The result was an arrangement which pioneered in sales and service—an arrangement under which Abilene Aviation Company will serve as a sub-distributor of parts and accessories for which the Dallas firm is a 5-state representative. Through this plan, private owners and operators in West Texas can purchase nearly every known aircraft component direct from Abilene without waiting for parts to be shipped. Territory allotted under the arrangement includes approximately 55 counties and will take care of an area from Graham to Plains, a portion of New Mexico including Hobbs, and from San Saba to Alpine.

A flying squad of Southwest Airmotive representatives arrived to survey Abilene Aviation's facilities to determine how much of each line the firm would need to serve its territory as an official sub-distributor. "Fast moving" merchandise, it was decided, will constitute nearly all of the inventory. Represented will be "AN" hardware, Weatherhead, Aeroquip, Continental, Warner, Lycoming, Jacobs, Ranger, Scintilla, Stromberg, Glidair, Goodyear, Pioneer, RCA, Jardur, Willard, Hamilton-Standard, BG, Bausch and Lomb, and others.

Daily Tab Avoids Shortages

Taking another page from the General Motors book of rules, Southwest Airmotive will keep Abilene's stock records at the Dallas office, posting sales as recorded and mailed to SAC each day. As soon as stock levels get low, SAC will automatically ship enough merchandise to guarantee against parts and accessories shortages.

The company's hangar is 100 by 100 ft. and is used principally for storage of privately-owned aircraft and demonstrators used by AAC in its capacity as dealer for Stinson, Beechcraft and Piper. Shops and parts rooms are located in a 20-foot lean-to built across the hangar's back. Parts manager Frazer planned and installed Abilene Aviation's neat, well-organized stockrooms. Metal bins 7 feet high have been divided into individual compartments in which stock is kept according to factory reference number. Frazer is also cleaning up the second floor area to expand his department for its role as a Southwest Airmotive sub-distributor.

Both Hughes and Higginbotham believe the arrangement with Southwest Airmotive represents the first practical effort to solve a problem that has long plagued personal aviation. "Our plant has a great future," Hughes said. "But the time has come when all of us must work to simplify and streamline our procedures. I'm expecting our deal with Southwest Airmotive to set a pattern that will be followed, at least in principle, throughout the United States. We're counting on just that sort of thinking and planning to send the aviation industry as far forward in the next 25 years as the automobile industry has come in that same period."

Part of Hughes' prediction has already been realized. During the next year, Southwest Airmotive will create a vast sales and service system in Texas, Oklahoma, Arkansas, Louisiana, and New Mexico. A comprehensive survey is being made to determine the most suitable operators in each area and these will be offered sub-distributorships under the same arrangement pioneered at Abilene Aviation Company.

How much the innovation at Abilene may mean to the aviation industry is well summed up by Southwest Airmotive, as follows: "We have every reason to think our system will be successful. Manufacturers are watching us, and we have their full support and co-operation. Before another year has passed, the 'Abilene Story' will be a story that everyone in aviation will know." ★ ★ ★

CESSNA DISTRIBUTORS held their first annual meeting recently at Wichita. Cessna speakers included Duane L. Wallace, president; Don Flower, sales manager; Frank Boettger, secretary-treasurer; Derby Frye, assistant sales manager; Frank Martin, regional sales manager; and Duane Travis, director of public relations. Guest speakers were C. J. (Jack) Reese, president of Continental Motors Corp.; L. C. MacGlashan, Gardner Advertising Company; E. S. Brinsley, Universal CIT, and Frank Sunderland of Edo Aircraft Corp. Distributors on the program included John Wright, Glen Burnie, Md.; Dewey Mauk, Blackwell, Okla.; Howard Morey, Madison, Wis.; and Harry Von Berg, Stockton, Calif.

WHAT'S NEW

Another flying auto: Latest flying automobile in the news spotlight is the "Airphibian," an all-metal "coupe" which flies after donning a short three-bladed propeller and a fabric-covered wing and tail section. Developed by Continental, Inc., a Danbury, Conn., concern, the Airphibian is powered by a 150-hp. six-cylinder air-cooled engine, has a 33½-ft. wing spread, a gross weight of 2,200 lbs., and a range of 400 miles on 30 gallons of gasoline. Fully loaded the flying auto carries only two people and fifty pounds of baggage.

Putting pinstripes on aircraft NC numbers has always been a time-consuming custom. To cut down the time and skill required to do this job, Wiggins Airways, Inc., of Norwood, Mass., is marketing a kit of pinstripe stencils cut from adhesive material similar to masking tape. Kits with twenty "N's," twenty "C's," and 10 of each numeral from "1" through "0" are priced to retail at $16. A stencil kit with letters 30 inches high retails for $23. Prices for individual letters and numerals range from sixteen to twenty cents each, according to size.

An electric paint sprayer, priced at approximately $30.50, is said to simplify lightplane refinishing. Known as "Thoro-Spray," the sprayer handles paint, varnish, enamel, lacquer and stain with equal efficiency and is powered by a 110-120 volt AC-DC universal electric motor. A built-in compressor develops 22 pounds of free air and has a convenient adjustable strap for easy handling. The device weighs eight pounds and is a product of the Lowell Manufacturing Company, Chicago, Ill.

A push-button control which disengages any engine-driven instrument at the first symptom of mal-functioning has been developed by Stratos Corporation, Babylon, L. I. This quick disconnection is said to be accomplished without damaging either the accessory or the aircraft engine and has been incorporated into the Stratos line of aircraft pressurization and air conditioning equipment. It will also be available to accessory manufacturers.

A classroom trainer, known as the School Link, has been developed by Link Aviation, Inc., to assist teachers in making aviation more tangible to students at all grade levels. Different from previous Link trainers, the new model is primarily a demonstration device and has an open cockpit. It contains all controls and control surfaces present in modern lightplanes and is free to bank, pitch and turn.

Every airline

in the United States uses

BENDIX·SCINTILLA

IGNITION EQUIPMENT

There is good cause for the fact that all the airlines in the nation turn to Scintilla for aircraft ignition equipment. Behind that preference stands a reputation for developmental skill and precision manufacturing that pays off in profitable operation.

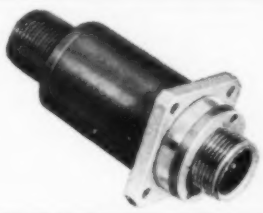
Featured prominently in the Scintilla product family are Bendix-Scintilla* magnetos which deliver the rich, hot spark at the precise instant needed to obtain the full power from every drop of fuel. Scintilla performance spells operating economy and profits for the airline. That's why Bendix-Scintilla is the standard of the industry . . . in use on every airline in America! Bendix-Scintilla ignition equipment is available to accommodate the largest or the smallest plane.

*TRADE MARK

SCINTILLA MAGNETO DIVISION of
SIDNEY, N. Y.

Bendix
AVIATION CORPORATION

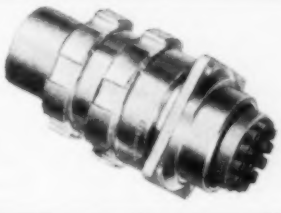
Bendix-Scintilla Radio Interference Filters are designed for insertion in aircraft ignition grounding circuits. Extremely successful in eliminating radio noise at very high frequencies.



Bendix-Scintilla builds both high tension and low tension aircraft ignition systems. The newly developed low tension systems are designed for extra efficiency, especially at high altitudes.

• • •

Bendix-Scintilla is also a leader in the field of Diesel Fuel Injection Equipment and is in wide use on railroad, marine and stationary Diesel engines.



Bendix-Scintilla Electrical Connectors are built in a wide variety of sizes and types. Precision-designed to give a pressure-tight, water-tight and radio-quiet assembly, they are performance-proved by thousands of installations.

IDAHO'S FLYING LEGISLATORS (above), an organization created out of mutual interest in personal flying, is probably the first of its kind in the nation. Front row, left to right, Rep. Leo Murdock, Rep. Edwin Snow, Sen. John H. Bahr, Rep. W. E. Drevlow, secretary; Sen. J. E. Williams, president, and Sen. E. J. Soelberg, vice president. Back row, left to right, Sen. Harry Wall, Sen. W. S. Geddes, Sen. John B. Thompson, Rep. Richard A. Egbert, Rep. Leonard B. Jordan, Rep. Harry Durall, and Sen. R. T. Greene. Four of the members—Williams, Soelberg, Thompson, and Drevlow—own personal planes.

DEALER NEWS

First deliveries of the Beechcraft Bonanza were made on Saturday, Feb. 15, and all regional distributors were expected to have their demonstrators at press time. Deliveries on the customer backlog will be made on a constantly-accelerated schedule during the spring and summer months, Beech officials said. Pilots for Beechcraft distributors who took early delivery included: John Ward, Atlantic Aviation Corporation, Teterboro, N. J.; F. L. Copeland, J. D. Reed Company, Houston, Texas; A. T. Groves, Airplane Sales Division, Butler Company, Chicago, Ill.; S. W. Fox, W. U. Paul, Corpus Christi, Texas; Mike Guidadis, Atlantic Aviation Service, DuPont Airport, Wilmington, Del. Bonanzas were also delivered to Pacific Aircraft Sales Co. of Burbank and Oakland, Calif.; Southern Air Services, Memphis, Tenn., and Southern Airways Company, Atlanta, Ga.

Float-equipped versions of Cessna's 120 and 140 personal planes, recently approved by the CAA, are said to turn in hard-to-match performance for side-by-side floatplanes. Equipped with Edo Model 1650 floats, the Cessnas are said to cruise at more than 90 mph. and have a top speed of 105 mph. Demonstrating increased utility as a seaplane, both models have substantially larger useful loads after floats are added. Although the floats mean a boost in empty weight, the useful load of the 120 is 672 pounds with floats, as against 660 pounds in the landplane model. The 140 shows a gain of from 590 to 602 pounds with floats and, in both models, the allowable gross weight is increased by 106 pounds.

The grand-daddy of all Piper Cubs, a two-place side-by-side Taylor Chummy built by Taylor Brothers Aircraft Company in 1928, was recently purchased by Bill Piper, Jr., from Dr. James E. Owen of Asheville, North Carolina. The Chummy, powered by a 100-hp. 5-cylinder Kinner engine, was built by the company from which Piper Aircraft Corporation emerged. Dr. Owen, who flew the Chummy back to Lock Haven, looped it over the factory in a final gesture of confidence.

Demonstration air shows will be staged this spring in many cities and towns throughout its territory by Aircraft Sales Co., of Fort Worth, distributors for Piper, Stinson and Republic Seabee. Leslie H. Bowman, president, former aerobatic champion, will headline the shows with low-altitude stunts in a special clipped-wing Cub his shop has built, but the major purpose will be demonstrations of safety and utility in lightplanes, five or six demonstrators being in the entourage. One of the demonstrators will be a Cub equipped for dusting crops. Advance men will arrange for attendance of as many sales prospects as possible to be on hand for the public shows.

Election of T. H. (Ted) Beck, longtime aircraft engineer once with North American, Northrop, Douglas, Glenn L. Martin, and other leading manufacturers, as vice president and chief engineer of Love Service Co., at Love Field, Dallas, has been announced by W. A. Ware, executive vice president and general manager. Beck was chief engineer of North American's Dallas factory during war production of P-51's, AT-6's and B-24's and more recently was chief engineer of Texas Engineering & Manufacturing Corp., present operators of the NAA factory.

Ware also announced Love Service Company is instituting an airline maintenance program for the repair, service, and overhaul of DC-3's, DC-4's, and Constellations. Twin test cells for engines are nearing completion on the firm's property, which includes 52,530 sq. ft. of hangar space, a 20,800 sq. ft. shop and other buildings, and 30 acres of paved ramp. A feature of the airline maintenance program will be an engine exchange deal in which overhauled power plants, minus accessories, will be immediately available at all times for quick installation or air shipment anywhere.

The Airport Division of the W. B. Matthews Co., of San Antonio, has expanded under a new name, Western Aero Supply Corp., and is taking on numerous additional lines of aircraft parts and supplies and intensifying its merchandising over a larger territory than ever.

Bulletins on Continental engine maintenance and engineering changes affecting service, formerly supplied only to dealers and distributors, are now available on an annual subscription basis to other engine repair shops, mechanics and private owners for three dollars a year. R. D. Hicks, Continental service manager, said the new service will in no way affect the mailing of general bulletins to all Continental engine owners when necessary, nor does it prevent individual owners from requesting and obtaining specific bulletins at no charge.

House moving is the latest profession to use the airplane in business. T. J. Plummer, Ogallala, Neb., house mover, recently purchased a Cub Special for use in his business. Around Ogallala, Plummer reports, the job of house moving is complicated by sandhills and poor roads. Since travel by car is extremely slow, Plummer bought the Piper not only to look over new moving jobs but also to scout best possible routes over which to move houses. Use of a plane increased business one-third through time saved in surveying a moving job and selecting correct routes.

PERSONALLY SPEAKING—

JOHNNY HOWARD, formerly regional sales manager for Luscombe Aircraft Corporation, is now field representative for Weatherly-Campbell Aircraft Co. of Dallas. . . . ELMER R. BAYLESS, former field service specialist for Wright Aeronautical Corporation, heads the corporation's parts department, a new department created to handle the sale and delivery of spare parts to customers. . . . ROBERT A. GATES, formerly assistant manager of customer service for Douglas Aircraft, has resigned to enter private business. . . . Douglas, which recently established a European division, announced the following personnel changes: W. S. FRYER was appointed assistant parts sales manager; J. B. PADEN, formerly field service supervisor for the Southern territory, was transferred to the Eastern territory to succeed W. A. SPENCER; and E. C. WAGNER was appointed supervisor of the Southern territory with headquarters in Atlanta, Ga. . . . LT. GENERAL BARNEY GILES, who served as commanding general of all Army air forces in the Pacific during the war, has been appointed by Air Associates, Inc., to head up the company's engineering division. . . . RALPH C. (BUD) CROCKER, who has been manager of Hawthorne Flying Service at the Greensboro-High Point, N. C., airport, was elected recently vice president of Hawthorne Flying Service.

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Chicago Clinic Focused on Private Flying Requirements

The needs of private flying in the second postwar year of expansion have been expressed differently in many localities during recent months, but many of them have been brought into focus in a series of resolutions to be presented at the Third CAA Region Air Clinic in Chicago, March 19-20. Charles E. Cox, Jr., assistant regional administrator for private flying development, will preside.

The resolutions stress the following:

That the present private pilot flight curriculum be studied to develop flight instruction less obnoxious to the non-flying public, less monotonous to the trainee and directed toward maximum utilization of private planes for transportation. In some quarters it is felt that prospective plane owners among middle-aged business men, who learn to fly as a step towards buying and operating their own planes for efficient transportation, should be encouraged by changes in the flight instruction curriculum emphasizing the private plane's value as a means of transport.

That a nation-wide air accident prevention program be organized; that planes be quieted in regard to engine and propeller noise; that local air shows featuring aerobatics be all but eliminated; that detailed where-to-go information be readily available at all airports; that airmarking be hastened; that states hasten designation of water bases for private fliers; that aircraft operating and maintenance costs be standardized on a known basis; that regulations covering private flying and aircraft maintenance be simplified; Federal aid for experimental private flying development increased; that uniform and less costly aids for small airports be developed, particularly those involving use of radio and lights; that the states' airport systems be integrated with their transport systems to permit airports in all categories to receive state benefits; that states initiate aviation education programs.

Final Study Shows 36,204 Aircraft Produced in '46

A total of 36,204 aircraft with a value of $362,772,192 were manufactured by the American aircraft industry in 1946, according to figures just released by the Department of Commerce. Of this number, 1,330 with a value of $191,972,255 were delivered to U. S. military customers, and 34,874 with a value of $170,799,937 to all other customers.

Two-place models predominated on the non-military side with 30,639 of this type delivered as against 4,235 three, four and five or more place models. Single-engine ships accounted for 34,407 of the non-military total and twin and four-engine types for 467.

From the standpoint of horsepower, 20,489 were in the under 75 class, 13,901 in the 75-399 class, and 484 in the over 400 class.

In addition to its output of complete airplanes, the American aircraft industry in 1946 produced 345 conversions with a value of $40,515,539, $31,771,480 of airframe spares for U. S. military customers, $17,715,397 of spares for non-military customers, $14,918,256 of modifications and other aircraft products, and $27,776,857 of non-aircraft products.

St. Louis Air Fair Set for May 9-18

The first regional aircraft show sanctioned by the Aeronautical Show Council (made up of AIA, NAA and other national organizations) will be held May 9-18 inclusive in St. Louis under the sponsorship of the Aviation Council of Metropolitan St. Louis.

The show, to be known as the "St. Louis Air Fair of 1947," will cover the states of Missouri, Illinois, Iowa, Nebraska, Kansas, Oklahoma, Arkansas, Tennessee, Kentucky and Indiana, and still other states have been invited to participate.

Over $70,000 already has been subscribed as a guarantor fund by St. Louis business men, and Col. Tod Bates, new director of the AIA National Aircraft Shows, has been obtained as executive director for the production.

Electron Compass Offers New Precision Navigation

A new electron-gun compass known as the Cathatrol was unveiled by Minneapolis-Honeywell Regulator Co. at the annual meeting of the American Institute of Electrical Engineers in New York. No larger than a flashlight, and containing no moving parts, the new device depends on a constant bombardment of electrons aimed at a target to provide direction signals and guide an airplane on a pre-set course. It is capable of precise readings hitherto unattainable with the conventional type of magnetic compass, and can be coupled to the directional gyro of the Honeywell autopilot, or equipped with any number of direction indicators. It can also be used as a magnetometer to prospect for oil, ores and other materials beneath the earth's surface.

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4-Place Output Up Sharply; Lightplane Deliveries Gain

Deliveries of lightplanes in January by 12 manufacturers reporting to the Aircraft Industries Association increased more than 6 per cent to total 2,055 in numbers and were up 17 per cent in value to a total of $6,412,000. December totals were 1,936 planes and $5,475,000.

The AIA report did not include a breakdown of aircraft by size, but its record of deliveries by manufacturers indicated January 4-place shipments totaled 650 planes as compared with 444 during December, 3-place deliveries steady at about 600 for January and December while 2-place deliveries declined from about 937 in December to about 804 in January.

January shipments were at a rate of 24,600 per year by manufacturers who delivered 31,500 lightplanes during 1946. Deliveries of 4-place planes were at a rate of 7,800 per year and 3-place deliveries were at a rate of 7,200 per year, as compared to a rate of only 9,648 per year for 2-place types.

Aeronca, which was the second largest producer for 1946 with 7,555 planes, reported only 161 shipments for January after reaching a low of 231 in December.

North American Aviation and Republic 4-place deliveries were sharply higher, being 238 Navions in January vs. 82 in December, and 103 Seabees in January vs. only 45 in December. Republic was shooting for 200 Seabees in February. Stinson was steady at 236 Voyagers in January vs. 237 in December and Bellanca dipped from 60 Cruisairs in December to 51 in January. Other companies reported January deliveries (December figures in parenthesis) as follows: Beech 1 (1), Cessna 420 (439), Funk 7 (13), Luscombe 120 (170), Piper 665 (607), Taylorcraft 31 (32) and Texas Engineering (Fairchild F-24's) 22 (19).

Creditors Give Globe Two Months for Plan; British to Build Swift

Given a 63-day period in which to formulate plans for possible adoption by creditors, Globe Aircraft Corp. last month reduced the sales price of its fully-equipped 125-hp. deluxe Swift $500 to $4,999 and its standard 125-hp. Swift $500 to 4,454, offered bonus deals to distributors for sales and continued negotiations with a British firm, Helliwell's, Ltd., for production of one thousand 125 Swifts in England on a license and royalty basis on tooling to be purchased from Globe.

Meanwhile, Co-trustee George Newman said export of Swifts was increasing. He is arranging for shipment of the planes to South America by airline to avoid the expense of crating.

Major creditors meeting on Feb. 12 voted to stand off their claims pending formulation of an acceptable plan for continued operations.

Soaring Meet in Florida

The First Southeastern States Soaring Contest was scheduled to be held March 1-2 at the Sanford Municipal Airport, Sanford, Fla., under the auspices of the Junior and Senior Chambers of Commerce. In addition to the glider contests for which $2,000 in prize money had been raised, an elaborate air show by powered aircraft was planned.

Oke City Withdraws as Clinic Sponsor

The Oklahoma City Chamber of Commerce has withdrawn as co-sponsor and host to the National Aviation Clinic, Stanley Draper, managing director of the Chamber, announced recently in a letter to the National Aeronautics Association, the other sponsor. Another city is expected to be host in 1947.

Draper attributed the Chamber's withdrawal to three reasons: (1) It now feels the Clinic is as firmly established as the Chamber's sponsorship can make it; (2) it is convinced that continued success of the Clinic is dependent on a constantly increasing amount of organizational time and effort, and (3) it believes an occasional change of location and host participation will be beneficial to the Clinic in future years.

SAE Personal Aircraft Meeting in Wichita, May 1-2

Eleven national meetings have been scheduled by the Society of Automotive Engineers in its tentative 1947-48 meeting program. New to the program is a personal aircraft meeting which will be held in Wichita, Kans., May 1-2. The program as announced starts with the spring aeronautic meeting, April 9-11, in New York, and concludes with the annual meeting, Jan. 12-16, 1948, in Detroit.

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The Mallard is one of 1947's newest aircraft, the latest in Grumman's famous line of rugged amphibians. Cruises at 185 mph. The answer to land-water operations into and out of inland and coastal waterways. Seat- and lounge-equipped for 10 passengers and crew of two. Has unusually comfortable interior.

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Private Flying Accident Rate Lower But Toll from Recklessness Increases

Despite a 58 per cent increase in the number of certificated and student pilots, non-air carrier aircraft accidents increased only 39 per cent in 1945 and the overall accident rate was 11.4 per cent lower than in 1944, according to a statistical analysis just released by the Civil Aeronautics Administration. However, the ratio of fatal and serious accidents increased from 10.2 per cent in 1944 to 13.2 per cent in 1945—due, CAA reported, to a wave of reckless, low and show-off flying together with students carrying passengers. All told, 7,252 people were involved in 4,652 accidents during 1945, with 508 fatally and 446 seriously injured.

Other highlights of the report revealed: (1) Reckless, low and show-off flying resulted in 192 fatal and serious accidents as against 90 in 1944, and together with student pilots carrying passengers accounted for 41 per cent of the 614 fatal and serious accidents; (2) student pilots carrying passengers were involved in 104 accidents of which 35 were fatal and 27 serious; (3) washout damage was 17 per cent as against 14.5 per cent in 1944; (4) in 76.9 of each 100 accidents no personal injury occurred.

A further breakdown of the various kinds of accidents showed that landing accidents accounted for 1,559 or 33.5 per cent of the non-air carrier total, with pilot error being responsible for 1,221, more than 50 per cent of which occurred during instruction.

Forced landings accounted for 950 or 20.4 per cent of the 1945 total; taxiing accidents for 589 or 12.7 per cent; collision with objects other than aircraft for 527 or 11.3 per cent; stall-spin accidents for 419 or 9 per cent; take-off accidents for 435 or 9.4 per cent; structural failures in flight for 20 or 0.4 per cent; collision with other aircraft for 18 or 0.4 per cent; fire for 15 or 0.3 per cent; miscellaneous for 75 or 1.6 per cent; and undetermined for 8 or 0.2 per cent.

Personnel error on the part of the pilot or others was listed as the primary cause of 3,441 of the total, 299 of the fatal, and 245 of the serious injury accidents. Material failures, many because of improper maintenance, inspection or servicing, caused 848 accidents of which 12 were fatal and 39 resulted in serious injury. As against this, other causes such as weather, terrain, miscellaneous and undetermined resulted in 363 accidents, 11 fatalities and 8 serious injuries.

Dart Offered in Assemble-Yourself Kits by New Firm

Marketing of the new two-place, 100-hp. Dart in CAA-approved kit form, disassembled for local completion, has been initiated by Dart Aircraft Corporation, recently organized as a division of Muller Industries, Inc., of Quincy, Mich. C. (Duke) Muller, head of the firm, pioneered merchandising airplanes in kit form, having introduced the first kit with Eddie Heath in 1926. Ray Applegate, marketer of the Dart, has embarked on a national tour to establish distributorships.

Under the new program, the $2,375 Dart kit is offered at $1,700 for the airframe and $675 for the power plant group, for assembly by the purchaser under guidance of an A & E mechanic. The factory says assembly can be done in less than 400 man hours.

The Dart is powered by a 6-cylinder, 100-hp. Continental engine equipped with a starter and its performance is described as including 120-mph. cruising speed at a fuel consumption of 6 gallons per hour and a landing speed of 40 mph. A low-wing monoplane with fabric-covered tubular steel fuselage and fabric-covered wooden-frame wing, the Dart weighs 1,040 lbs. empty and 1,550 lbs. gross. It was formerly built at Tecumseh, Mich. Applegate has demonstrated the new model at numerous exhibitions including the recent Miami Air Maneuvers.

AAF Needs Aerologists

The Army Air Forces is seeking 883 former meteorologists or aerologists to return to active duty with the AAF Weather Service, now critically handicapped by a shortage of personnel. Authority has been given to return to active duty all former AAF weather officers who volunteer, and to give Army of the United States commissions equivalent to the rank formerly held by weather officers of other branches of the service who volunteer with the AAF.

New Radio Charts

A new series of radio facility charts has been introduced by the U. S. Coast and Geodetic Survey. Forty-two separate charts, reproduced on 8 x 10½-in. paper with a margin for binding, comprise the series. The charts provide complete radio information to facilitate the planning and execution of cross-country flights, and were developed at the specific request of the Air Transport Association.

Air Transport

Pioneer Air Lines began service February 19 on its recently-granted route extensions. New cities now being served by 24-place DC-3's are Bryan, Temple, Waco, Dallas, Fort Worth, Mineral Wells, Sweetwater, Big Spring, Midland, Odessa and Lamesa. . . . Mid-Continent Airlines inaugurated service to Houston and Tyler on its Route 80 February 1. . . . T. E. Braniff and an official party left last month on a DC-4 survey flight to South America over Braniff's 7,719 miles of international routes.

The AAF's all-weather airline, known as the "Green Ticket Run", completed its first six months of operation with 125 round-trips completed and only two flights unable to complete—one because of hydraulic failure, and the other because of the number of aircraft in the Washington "stack". . . . Trip-Eze, a war-developed remedy for air-sickness, will soon be available to passengers on Trans-World Airlines. In Army tests, Trip-Eze gave complete relief to 149 out of 156 persons admittedly susceptible to airsickness, mild relief to five others, and no relief in only on case. The remedy is put up in candy-coated chewing gum form.

Santa Fe Skyway, Inc., air affiliate of the Atchison, Topeka & Santa Fe Railway, inaugurated contract air freight service between San Francisco and the Midwest February 3 with a plane load of calculating machines and cut flowers. . . . During the winter months, the scheduled airlines complete less than 25 per cent of their trips within one-half hour of schedule, William A. M. Burden, Assistant Secretary of Commerce for Air, told a recent aviation dinner meeting of the Society of Automotive Engineers.

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2. SPECIAL MARKET SURVEYS: We are now equipped to conduct surveys by mail or personal interview, to determine market potentialities for any aircraft or aviation product in any section. Analyses will be supplied to fit the needs of individual clients. Time and cost estimates without obligation.

3. SPECIAL LISTING SERVICES: Special listings of aircraft by make and model, year of manufacture, horsepower, etc. May be compiled by owners' names and addresses, or by statistical arrangement for market analysis, or inventory control of airplane and engine parts and accessories. Listings current with CAA aircraft registration records on date run is made. Inquiries promptly answered.

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. . . *Write to:* AIR REVIEW PUBLISHING CORPORATION, P. O. Box 750, 1901 McKinney Ave., Dallas 1, Texas. (Offices in Dallas, Detroit, New York)

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3-Day Helicopter Forum in Philadelphia, March 27-29

The American Helicopter Society will hold its Third Annual Philadelphia Forum in that city on March 27-29. The first two days will be devoted to meetings covering technical developments, service testing, operations and economics of the helicopter, while the final day will be taken up with helicopter flights and exhibits. Recent helicopter developments included:

What is believed to be the first commercial financing of helicopter purchases has been undertaken by the Buffalo Industrial Bank on behalf of two Bell Aircraft Corp. customers—Central Aircraft, Inc., Yakima, Wash., and New England Helicopter Service, Providence, R. I. The same procedures and rates used in financing conventional aircraft sales were followed, according to Carlton P. Cooke, president of the bank.

The helicopter is not only a great asset in fighting forest fires, but also the ideal medium for controlling and combatting tree disease, Kenneth K. Hay-Roe of Bell Aircraft Corp. told delegates to a recent meeting of the Canadian Pulp and Paper Association in Montreal. He said that the craft's rotors drive air down with an initial velocity of 25 mph., forcing dust or spray down through trees and swirling it up again to coat the underside of the leaves. Further, the helicopter can hop from tree to tree to give individual attention such as is required with Dutch Elm Disease.

Helicopter Air Transport, using three Sikorsky S-51s, recently delivered parcels to 66 Connecticut cities and towns in a single day, as part of the centennnial celebration of G. Fox & Co., Hartford department store.

PERSONALS

JACK FRYE announced last month he was "not up for re-election" as president of TWA because of disagreement over policy.

CHARLES W. DEEDS has resigned as president and general manager of Niles-Bement-Pond Co., but will remain a director. FREDERICK U. CONARD, vice president of Underwood Corp., has succeeded him. . . . PRENTISS CLEAVES, recovering from injuries in the crash of Lockheed's experimental "Big Dipper," is president of Seair, Ltd., and executive manager of a syndicate sponsoring Silver Strand Skyport, a seaplane-landplane base on San Diego Bay. . . . DON R. BERLIN has been elected general vice president of McDonnell Aircraft Corp., in St. Louis, in charge of aircraft contracts and engineering.

PRESTON R. BASSETT, president of Sperry Gyroscope Co., has been elected president of the Institute of Aeronautical Sciences. New IAS vice presidents are Rear Admiral Luis de Florez, John K. Northrop, Wellwood E. Beall, and Rex B. Beisel, and Burdette S. Wright is the new treasurer. . . . IGOR I. SIKORSKY, engineering manager of Sikorsky Aircraft, has been awarded the Gold Medal of FAI for outstanding aeronautical achievement in 1946, and has received from New York's American Legion Air Service Post 501 the Frank M. Hawks Memorial Trophy in recognition of his development of the helicopter. . . . W. WALLACE KELLETT, LIVINGSTON PLATT and JOSEPH W. POWELL, directors of Republic Aviation Corp., have been elected directors of Aircooled Motors, Inc. . . . T. A. KNOWLES has been appointed vice president and general manager and CHARLES H. ZIMMERMAN named factory manager in promotions at Goodyear Aircraft Corp., whose vice president and general manager, RUSSELL DEYOUNG, has been named vice president and a director of the parent firm, Goodyear Tire and Rubber Co.

LT. GEN. HAROLD L. GEORGE, president and general manager of Peruvian International Airways, has announced plans for starting one-carrier, 24-hour schedule air service in March from Montreal to Lima via New York, Washington, Havana and Balboa. He now resides in Lima. . . . FRED M. GLASS, vice president-traffic of Capital Airlines-PCA, has been named president of Air Cargo, Inc., the new ground-service setup operated by the scheduled domestic airlines. . . . JAMES G. RAY, vice president of Southwest Airways, has accepted chairmanship of the ATA's working committee on feeder airlines. . . . E. M. STURHAHN, formerly executive assistant to the administrator, has been appointed to succeed ALVIN O. PREIL as assistant CAA administrator for business management, and H. LLOYD CHILD has been appointed assistant to the administrator for private flying development to succeed JOHN H. GEISSE. FREDERICK LEE succeeds Sturhahn in his former position.

WILLIAM P. REDDING, National Aeronautics Association leader for many years who spent a lifetime promoting aviation, died on Feb. 17 at Mayo Clinic at the age of 62. . . . Following the death of ADMIRAL MARC A. MITSCHER from a heart attack on Feb. 3, VICE ADMIRAL WILLIAM H. P. BLANDY succeeded him as commander of the Atlantic Fleet.

Col. Johnson Killed

Colonel Earle L. Johnson, prominent Ohioan and Army Air Forces officer who was national commander of the Civil Air Patrol, lost his life last month in the crash of an Army C-45 he was flying.

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SCR-269, MN-26Y
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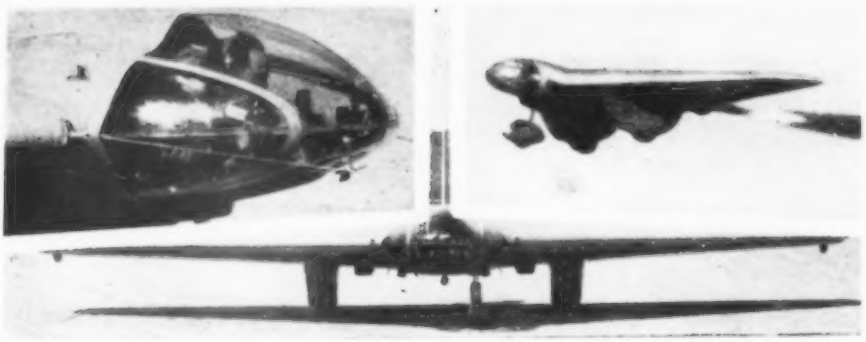

FIRST ROCKET FIGHTER has been revealed to be Northrop's experimental MX-324, which flew in secrecy in 1944. A head-on view of the flying wing is shown above, with the late Harry Crosby, test pilot, shown (inset, left) in its prone cockpit. Flight view is in right inset. It weighed 4,000 lbs., had an Aerojet XCAL-200 rocket motor burning liquid mono-ethyl-aniline through reaction with red fuming nitric acid. Crosby lost his life later in flight testing. (Northrop Photo.)

Probers Told Airline Safety Surpasses ATC, NATS Records

Testimony by Robert Ramspeck, executive vice president of the Air Transport Association, William A. M. Burden, Assistant Secretary of Commerce for Air, Arthur E. Raymond, vice president, engineering, Douglas Aircraft Co., and Glenn L. Martin highlighted the air safety investigations which got into full swing last month in Congress.

Burden, testifying before House Interstate and Foreign Commerce Committee, revealed that the safety record of the scheduled airlines over the last three years was far superior to that of the Air Transport Command and the Naval Air Transport Service. In domestic operations the airlines had a rate of 1.24 passenger fatalities per 100,000,000 passenger miles in 1946, 2.14 in 1945, and 2.09 in 1944. The ATC record was 8.2 in 1946, 6.0 in 1945 and 5.5 in 1944; and the NATS record 10.8 in 1946, 19.7 in 1945 and 18.1 in 1944. When international operations also were included, the ATC record was 1946, 8.0, 1945, 4.9, 1944, 10.7; the NATS record, 1946, 1.8, 1945, 3.9, 1944, 8.0; and the airlines record, 1946, 1.6, 1945, 2.31, 1944, 2.48.

Appearing before the same group, Ramspeck reported that the scheduled airlines of the United States had made a total of 2,474,700 take-offs and landings in 1946, with only eight resulting in passenger fatalities.

In the matter of landing aids, Martin recommended to a Senate committee that we must have both GCA and ILS systems, but that GCA must be in command. He cited the Navy's decision after 20 years of experimentation to leave all judgment decisions in directing the approaches for carrier landings to a flag-equipped signal officer on the flight deck rather than to the pilots themselves.

Raymond, listing hundreds of engineering and design improvements of the last few years to cite the airline transport as "the most carefully engineered product used by man," urged Congress to support development of airborne devices to avoid obstacles, weather reporting improvement and a program for navigation and traffic control aids.

Burden Lauds Constellation for Safety Modifications

Investigation has revealed that the supposed reason for which all Lockheed Constellations were grounded following a training accident last summer was not the cause of the accident, according to a statement by William A. M. Burden, Assistant Secretary of Commerce for Air, before the Senate committee investigating air safety.

He added that once the grounding action was taken, the opportunity was used to make certain modifications which made "the Constellation, already a fine airplane, undoubtedly the most advanced airplane of its class in service in respect to safety."

In his statement, which was given to show the senators the manner in which the CAA approves new transport aircraft, Burden used the Constellation as an example, and pointed to the fact that it had a total of 4,670 hours, or 1,401,000 miles of test flying before it went into commercial airline service.

4,500 Reserve Transports Operated by Airlines Urged by C. R. Smith for Defense

The nation's air power program for peacetime defense preparedness should include a fleet of 4,500 air transport planes operated by the airlines, C. R. Smith, American Airlines chairman, recommended last month in an address before the Air Power League in the Library of Congress. Less than 1,000 transports are presently operated by the carriers.

He said approximately 10,000 transport planes were operated by the Allies at the end of the war and suggested half that number as the minimum "ready" fleet for U. S. preparedness. Of this 5,000, the AAF would have "logical reason" for operating 500 transports, leaving 4,500 to be provided. He pictured the airlines as the most logical source from which defense transport needs can be met, and urged a program for insuring self-sustaining operations of the reserve fleet by the carriers.

"Parcel post by air is a potentiality and may be available during the year," Smith said. "First class mail by air will provide additional lift, additional communications service and additions to the transport reserve." Other factors he outlined as including freedom for carriers to expand without restrictive taxation and legislation. On the basis that all transports are available for wartime operation, it is logical for the armed service to assume responsibility for developing new transports as they have done during the war with the DC-6 and Stratocruiser, he said.

Meanwhile, Major General Laurence C. Craigie, chief of the Air Materiel Command's engineering division at Wright Field, told a science forum that plans are now under way to make the entire Army "totally air transportable." Calling for upper-air research funds, he said the possibilities of global warfare "make it mandatory that we have transport and cargo aircraft of such size and volume to move complete divisions of fully-equipped ground troops over thousands of miles in a minimum of time.

Ryan Building Secret New Army Fighter

Ryan Aeronautical Co. has received a $700,000 increase in a previously unrevealed contract with the Army Air Forces for development of a new, highly-advanced type aircraft of the company's own design. No details as to the aircraft were revealed.

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As of Feb. 1, the 26 states shown in the shaded area above had Flying Farmer organizations, according to the Flying Farmer News Letter. Of those shown in white, Alabama, Georgia and New York were on the list to be organized in the near future.

Flying Farmer Movement Spreads with Chapters Organized in 26 States

Eight more states have jumped on the Flying Farmer bandwagon to raise the total of those with their own local chapters to 26. Latest to join the ranks are New Mexico, California (which closed its organizational meeting with 75 members), Michigan, Idaho, Oregon, Washington, Mississippi, Pennsylvania, and Utah. The Idaho, Oregon, and Washington chapters were organized at a joint meeting in Spokane with over 400 delegates in attendance.

Recent Flying Farmer activities included: 35 of the 74 members of the Michigan Flying Farmers Association own their planes. One member last Fall used the propeller blast from his Cub in saving $500 worth of pickles from freezing—his propeller stirred the air over the pickle patch just before dawn and for an hour after daybreak he flew back and forth, at low level, according to Lee J. Talladay of Milan, Mich., president.

Iowa's flying farmers last month began an airmarking campaign through high school groups, with some 50 towns being air-marked in the first go-round.

Membership in Kansas' Flying Farmers Club has passed the 200 mark, according to Alfred Ward of Johnson, president.

Although the Oklahoma Flying Farmers count around 125 members, Lloyd Watkins of Hobart, president, estimates there are 250 farmers in the state who fly. Clayton Beard of Tahoka, president of the Texas Flying Farmers, estimates there are 600 Texas farmers who fly. The new Texas group already has a membership of 140.

The second annual meeting of the Colorado Flying Farmers will be held at Colorado A. & M. College, Fort Collins, on May 12, according to H. D. Finch of Fort Collins, secretary. Fifteen new members have joined since the group organized last July 16, bringing the membership to 53. An air tour will be held in August or September.

First event of 1947 in Ohio will be a Flying Farmers Day on March 21 during the annual Farm and Home Week at Ohio State University, Columbus, according to Ray T. Kelsey.

"It is our firm conviction that rural aviation is going to point the way for the development of all private flying—because of the great uses to which a farmer can put an airplane," comments C. Harold Hopkins, Davis, Calif., president of Flying Farmers, Inc., of California. Farmers from all over the state are using an airport he constructed on his ranch because of its closeness to the University of California's College of Agriculture.

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Memphis Municipal Open to Private Flying Again; Berry Field for Sale

By GENE SLACK TEAGUE

For the first time since 1942, Memphis municipal airport is open for private flying. Dixie Air Association acquired two hangars and has services operating now. Louis Hullett is president of Dixie. . . . Nashville's Berry Field, largest municipal airport in Tennessee, is open for sale to the highest bidder, the War Assets Administration announced recently. The airport, leased by the Army Air Forces during hostilities, was declared surplus before the lease expired.

Embry-Riddle Field at Union City has been turned over to civilian use and renamed Tom Stewart Field, in honor of the state's Senator Stewart. It contains 700 acres of land, four hangars and a large administration building. Adams & Reed are in operation. . . . Humboldt Airport (class 2) expects to spend $22,978 matching Federal funds this year. . . . There are plans in progress for 29 new airports in the state. . . . Henry County bought the Graves Airport near Paris with an eye to Federal funds. . . . Fulaski Airport was dedicated recently with an air show and air meet. . . . Oak Ridge (of atom bomb fame) has a private airport under construction nearby. M. R. Skidmore owns it.

Tennessee Flight Operators Association met in Nashville February 18-19, to work out fine points on GI training. Their chief difficulty in these programs has been in the handling of ground school, which has been com-

Air Guard, ROTC Instructors and Reserve Commanders Confer

Tenth Air Force Headquarters at Brooks Field, San Antonio, was host last month to over 40 Air National Guard instructors, Air Reserve detachment commanders and Air ROTC instructors and others from Texas, Louisiana, Arkansas, Oklahoma, Arizona and New Mexico. Photographed at the conference, left to right were:

Air Reserve Commanders (right)—First Row: Maj. S. J. Harris, Biggs Field, El Paso; Lt. Col. G. M. Graham, Fort Worth Army Air Field; Lt. Col. I. H. Shearer, Hensley Field, Dallas; Maj. H. E. Short, Brooks Field. Second Row: Lt. Col. T. C. Netcher, 10th Air Force; Lt. Col. S. F. Martin, New Orleans; Col. R. W. Warren, Ellington Field, Houston. Top Row: Maj. W. T. Douthwaite, Barksdale Field, Shreveport; Maj. J. M. Smith, Bergstrom Field, Austin; Maj. W. D. Brandon, 10th AF; Lt. Col. W. C. Adams, Tinker Field, Oklahoma City; Capt. D. O. Hollingsworth, Goodfellow Field, San Angelo; Maj. J. M. Todd, Tulsa.

Air ROTC Instructors (lower left)—First Row: Maj. P. H. Penn, Oklahoma A. & M.; Lt. Col. R. P. Riordan, Texas Tech; Maj. R. S. Reid, University of Oklahoma; Maj. A. S. Freer, University of Arkansas. Second Row: Lt. Col. L. B. Matthews, LSU; Lt. Col. D. W. Wallace, New Mexico A. & M.; Maj. J. W. King, 10th AF; Lt. Col. D. L. Hodge, Texas A. & M. Third Row: Maj. B. H. Mayall, Air Scout liaison officer, Dallas; Maj. J. L. Westfahl, 10th AF; Lt. Col. J. A. Nendell, 10th AF.

Air National Guard Instructors (lower right)—First Row: Col. E. W. Richardson, Norman, Oklahoma.; Col. Ivan W. McElroy, Ellington Field, Houston; Col. J. S. Jenkins, Houston; Col. W. H. Schwartz, Hensley Field, Dallas. Second Row: Maj. J. G. Milne, Kirtland Field, Albuquerque; Lt. Col. R. M. Caviness, Ellington Field, Houston; Lt. Col. N. A. Anderson, Brooks Field; Maj. R. R. Evans, New Orleans. Third Row: Maj. R. C. Embrey, Norman, Okla.; Maj. L. W. Hough, Jr., 10th AF; Maj. H. H. Kirby, Adams Field, Little Rock; Maj. E. E. Beaty, Tulsa.

—(10th AF Photos.)

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plicated by the relaxation of the CAA regulations concerning ground school and written examinations. . . . Members of the Obion Flying Club at Obion are trying to secure a landing strip near Reelfoot Lake, hunting and fishing center of northwest Tennessee.

The Tennessee Bureau of Aeronautics, in an airmarking program, divided the state into sections and assigned an operator in each section to attend to roof releases.

Alabama Operators Busy; Meixell at AASO Meet

By EDITH WIDEMAN

With the clearing of the weather the fixed-basers are expending their pentupness in mid-air. B. F. Autrey just practically dipped his wings over Roberts Field upon returning from a trip to Dallas before dashing to Florida. Jock Thacker hied away on the wing—a Stinson selling trip. Red Beasley flew South to Mardi Gras taking O. C. Dobbs along. Stinson's Bill Wieler and C. J. Smith breezed in from Atlanta. Bryan Hammett of Southern Airways' Huntsville operation paid a pop-call to their Birmingham operation. The GI Commercial School at Central Park is booming after a practically wet workstoppage. The new restaurant at C. P., is a gloriously-welcomed addition. L. E. Newman, general manager of Aircraft Sales & Service, reports they're selling the wind out of the new Cessnas—most recent one went to Stringfellow Lumber Company to be used in the biz. A new Cessna dealer is State Line Air Activities at Bridgeport.

The Alabama Air Service Operators met in a day-long session in Montgomery with NATA's Harry Meixell making the banquet address.

Texas Airmen Protest Aviation Taxation

Representatives of all phases of Texas commercial and private noncommercial aviation met in Waco last month and unanimously passed a resolution requesting the legislature to continue support of the aeronautics commission through appropriations from the general fund instead of from taxation of aviation fuel. At the present time the four-cent per gallon gasoline tax is collected but returned on demand of the user of gasoline for non-highway purposes. The resolution pointed out that dependable estimates reveal that approximately $100,000 in unreturned taxes on aviation fuel remains in the state general fund each year which is sufficient to carry on the work of the commission.

The group went on record against the state aeronautics act being amended to empower state officials and courts to prosecute reckless flying charges. It also criticized a proposed bill to levy an intangible revenue tax against charter operators and airlines.

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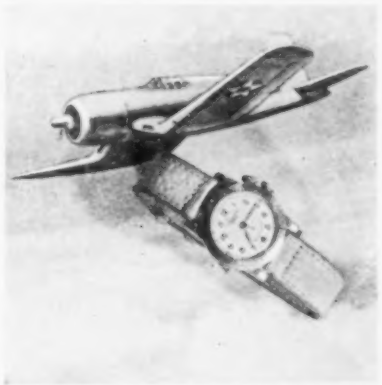

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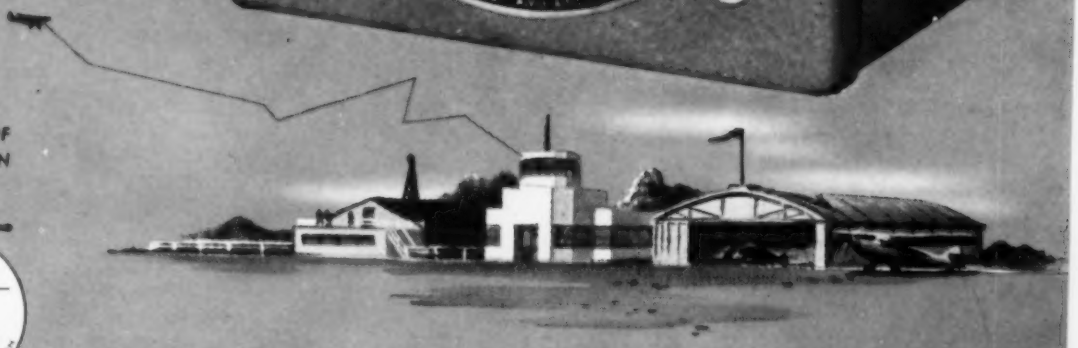

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